

21 REVIEWS • HARD DRIVES • WORD PROCESSORS • VIDEO • ONLINE

MACWORLD

The Macintosh® Magazine

September 1990

\$3.95 Canada \$4.95

THE BEST

44

MAC PRODUCTS

*Readers choose the winners
of our 4th annual World-Class Awards Contest*

#440H*****5-DIGIT 58105
#CMB CERESH90#
540316 CMB CERESH98
JANE CUMBER
ADMISSIONS OFFC
CERES HALL RM 124
FARGO ND 58105
09 C
APR 91
EAOJ
#44

Some think there's no a Microsoft applications. T the same thing abo



Nobell Chem Revenue Potential Product Portfolio Breakout

	1989	1990	1991	1992
High Growth Markets				
Medical Applications	15	25	40	60
Industrial Applications	30	39	46	51
Total	45	64	86	111
% of total	55%	63%	68%	72%
Mature Markets				
Defense Applications	36	38	40	42
% of total	45%	37%	32%	28%
Total Revenue	81	102	126	153



N o b e l l C h e m

Report to the Board of Trustees

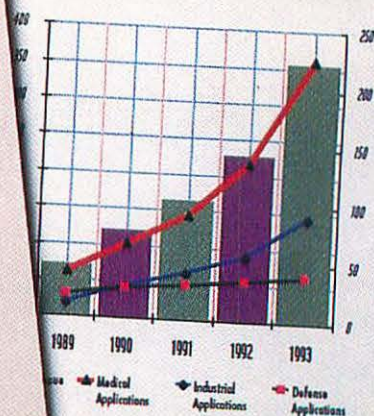
During the past twelve months, the Nobell Chem Corporation pulled far ahead of the competition, through the diverse and strategic marketing of its Nitro Glycerin compound.

Nitro Glycerin, which was discovered in 1847 by Ascanio Sobrero and commercially developed by Alfred Nobel (Nobel Prize fame), has long been used in the manufacturing process of dynamite.

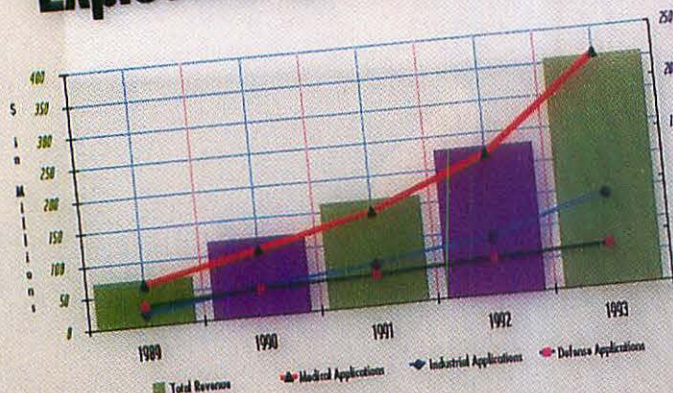
Nobell Chem has now become a leading marketer of Nitro Glycerin in pill form, to aid in the treatment of heart disease. As a result of this development, Nobell Chem is now expanding its distribution channels.

1989	1990	1991	1992	1993
15	25	40	60	85
30	39	46	51	72
36	38	40	42	44
81	102	126	153	201

Explosive Growth Potential



Explosive Growth Potential



Advantage to combining men again, some thought at nitro and glycerin.

If you own a Mac® you may already know what a phenomenally powerful piece of software Microsoft® Word is.

And, most likely, you're also aware of how powerful Microsoft Excel is. Well here's something you probably don't know:

When Word and Microsoft Excel are combined, they're even *more* powerful. In fact, they're nothing short of explosive. Pun intended.

Because together Word and Microsoft Excel allow you to exploit the Macintosh®'s operating system in a way that has never been possible before.

We call this unprecedented feature "warm links." But you'll be more inclined to call it the best thing for revising documents since white out.

Here's how warm links works. Imagine it's the end of the day and tomorrow's the BIG presentation. You've been working with the sales manager to incorporate his Microsoft Excel projections into your report. You're finally done. But wait. Suddenly he makes one of his famous last-minute changes to the spreadsheet.

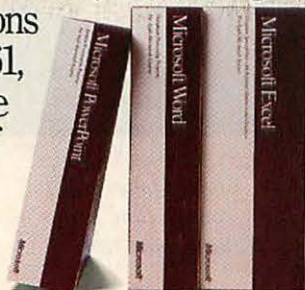
This is where warm links saves the day (or the hour). No more antiquated manual moves of opening and closing your document, cutting, pasting and praying. With warm links, you simply open your Word document and select Update Link. Word automatically finds the latest Excel data and updates

your report. It's as simple as it sounds.

Of course, because we are talking about the BIG presentation here, you'll want to go the extra step and blow them away. Enter Microsoft PowerPoint®. It's the easiest way to create attention-getting overheads and slides in black and white or color. Just cut and paste data from Word or Microsoft Excel into your presentation, draw, color, shadow, and take a bow.

As you probably know, Microsoft and the Macintosh have an unusually close relationship. We've been involved with the Mac since the beginning. Which means we know how to get the most out of it, now. So, if you want to coax ever more capability from your Macintosh, depend on these and the rest of the Microsoft line of business applications, that are always designed to get a powerful reaction from each other. And your Macintosh.

For a free brochure that describes how you can improve productivity by using Microsoft's Mac applications together, call (800) 541-1261, Dept. K29. Ask about The Microsoft Office—four of Microsoft's best-selling business applications at a great price.



Microsoft®
Making it all make sense®

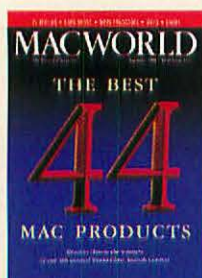
Edit	
Can't Undo	⌘Z
Cut	⌘H
Copy	⌘C
Paste	⌘V
Clear	
Again	⌘R
Table...	
Glossary...	⌘K
Show ¶	⌘Y
Paste Link	⌘F4
Update Link	⌘F3

After you update your data in Microsoft Excel, select "update link" from Word's edit menu, and the change will automatically appear elsewhere.

CONTENTS



DEPARTMENTS



And the winners are . . . Once again, Macworld readers have cast their votes for their favorite Macintosh products. See page 162 for this year's recipients of our annual World-Class awards. (Photo by David Bishop.)



A 3-D modeler brings slick animation to TV commercials. See News, page 129.

How to Contact Macworld	12
MacBulletin	19
Commentary/Jerry Borrell	25
Letters	43
Art Beat	63
<i>By Cathy Abes</i>	
The Iconoclast	69
<i>By Steven Levy</i>	
Conspicuous Consumer	85
<i>By Deborah Branscum</i>	
State of the Mac	99
<i>By Bruce F. Webster</i>	
Verbatim	107
<i>Altsys's James Von Ebr</i>	
News	129
<i>By Dan Littman and Tom Moran</i>	
New Products	293
How To/Quick Tips	307
<i>By Lon Poole</i>	
How To/Getting Started with Desktop Video	319
<i>By Jim Heid</i>	
How To/Insights on Canvas 2.1	329
<i>By Erfert Fenton</i>	
Updates	335
Where to Buy	341
Best-Sellers	400

FEATURES

Macworld's Fourth Annual 1990 World-Class Awards 162

By Suzanne Stefanac The vote is in: we proudly present the 44 prizewinning hardware and software products our readers chose for 1990.

Word Processor Olympics 172

By Robert C. Eckhardt This year's top wordsmiths fight it out in advanced-feature competitions ranging from footnotes to indexes, merges to style sheets.

With a Little Help from My Mac 180

By Brita Meng With Macs functioning as arms, eyes, ears, and voice, disabled users are reaching their goals of autonomy and self-reliance.

Best Buys in Low-Capacity Drives 189

By Cheryl England Spencer Looking for a 40MB to 80MB hard drive? Before you go shopping, check out our comprehensive review.

Life Online 198

By David Pogue One man's week-long odyssey navigating the electronic jungle of information services.

Prime-Time Video 206

By Peter S. Marx and Franklin N. Tessler Whether you're an amateur filmmaker or you need broadcast-quality video, there's a video digitizer to suit you and your budget.

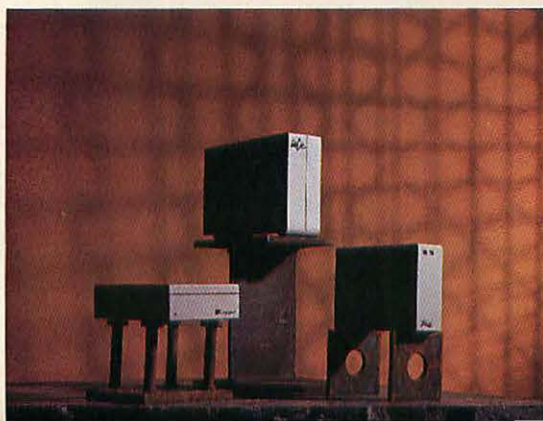
Connecting with IBM Mainframes 214

By Dave Kosiur With the abundance of new connectivity tools, it's easier than ever to put your Mac on speaking terms with a mainframe.



Which contender will capture the gold in this year's Word Processor Olympics? See page 172.

Get the scoop on the best—and the worst—40MB to 60MB hard drives, page 189.



REVIEWS

Outbound Laptop System 224
Portable laptop Macintosh.

Aldus PageMaker 4.0 225
Page-layout program.

Publish It Easy 1.10 228
Page-makeup software.

WriteNow 2.2 232
Word processor.

MacinStor Erasable Optical 239
High-capacity erasable optical drive.

Correct Grammar for the Macintosh 1.0.1, Grammatik Mac 1.0, and RightWriter for the Mac 3.1 241
Three grammar checkers.

Icon-It 2.0 243
Icon customization software.

Jigsaw 1.0 244
Puzzle game.

Encore 1.2.1 246
Musical notation package.

Easy Color Paint 1.1 248
Basic color-paint program.

Photolink 252
Infrared wireless connectors for LocalTalk.

MIDI Time Piece and Studio 3 257
Two professional MIDI interfaces.

Accountant, Inc. Professional 1.03 259
Business accounting program.

Welltris 263
Arcade game.

Dream Machine: The Visual Computer and Martin Luther King Jr. 266
Interactive video packages.

Adobe Type Reunion 1.0, Fontina, and MenuFonts 3.0 268
Font-menu customizers.

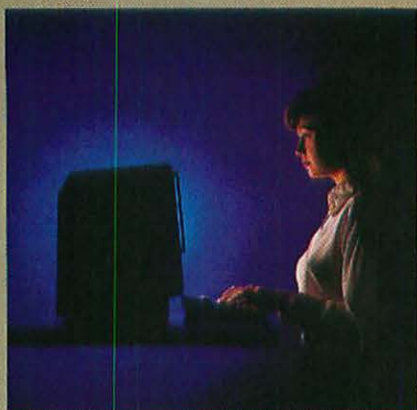
File Force 1.0.1 272
Simple relational database.

On Location 1.0 274
File- and text-finding utility.

CD Technology Porta-Drive, NEC Intersect CDR-72, and TXM-3201A1-Mac 278
CD ROM drives.

Webster's Ninth New Collegiate Dictionary, CD ROM Edition 281
CD ROM reference tool.

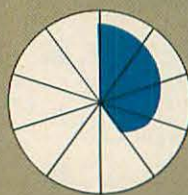
Window Shopping 287
EPS Teacher's Assistant 1.1, Grade Machine 3.0, and Make-Test 1.1.1.



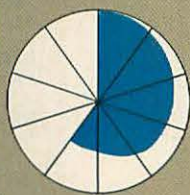
All video display terminals (VDTs) emit electromagnetic radiation (EMR) through the screen. The photo on the left is a visualization of EMR in red from the screen. The photo on the right shows that the NoRad Shield™ virtually eliminates screen-emitted E-Field EMR and better than half of magnetic EMR.*

NoRad Radiation Shield No One Comes Close

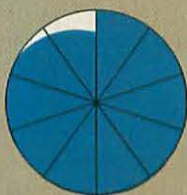
SHIELDING TECHNOLOGY COMPARISON TO 1 GHz



CARBON MESH



GLASS/ACRYLIC



NORAD SHIELD

Figures are based on independent lab tests conducted to Military Specification MIL-STD 285 of the NoRad Shield™ and other commercially available radiation-blocking screens.

No other VDT screen comes close to the NoRad Shield™ when you're talking about blocking electromagnetic radiation (EMR). If you're thinking of buying a radiation shield, consider the facts:

- Only the NoRad Shield™ blocks virtually all E-Field EMR*
- Only the NoRad Shield™ blocks magnetic EMR*
- And, the NoRad Shield™ discharges the static field while eliminating glare and reflections.

The NoRad Shield™ – simply the best radiation shield available. Compare and you'll see that no one else even comes close. Call for free product information.

Circle 468 on reader service card.



- Easy to install
- Color or monochrome
- Available in sizes to fit virtually all monitors, displays and terminals

NoRad

800-624-8999 Ext. 498
NoRad Corporation 1549 11th St.
Santa Monica, CA 90401 213-395-0800
CANADA: ECLECTIC PRODUCTS
604-624-5168

MACWORLD

Editor-in-Chief **Jerry Borrell**

EDITORIAL

Executive Editor **Adrian Mello**

Managing Editor **Charles Barrett**

Editorial Manager **Jane Lagos**

Senior Associate Editor/Depts. **Deborah Branscum**

Senior Associate Editor/Lab Manager **Chip Carman**

Senior Associate Editor/Features **Joe Matazzoni**

Senior Associate Editor/East Coast **Brita Meng**

Senior Associate Editor/Reviews **Carol Person**

Senior Associate Editor/Features **Cheryl E. Spencer**

Associate Editor/Departments **Cathy E. Abes**

Associate Editors/News **Dan Littman, Tom Moran**

Associate Editor/Features **Suzanne Stefanac**

Associate Editor/Reviews **Liza Weiman**

Senior Production Editor **Luis A. Camus**

Senior Copy Editor **Ruth Henrich**

Assistant Editors **Mark Hurlow, Mary Margaret Lewis**

Production Editor **Jo Ann Villalobos**

Copy Editors **Marjorie Baer, Emily Bowser,**

Felicity O'Meara, Katherine L. Ulrich

Production Assistant **Lisa Brazial**

Editorial Assistants **Julian C. R. Okwu, Tim Warner**

Editorial Administrative Assistants

Suzanne Courteau, Lyn Taylor

Assistant to the Editor-in-Chief **Sandy Butler**

Andrew Fluegelman Intern **Jonathan Cassell**

Contributing Editors **Nancy E. Dunn, Robert C. Eckhardt,**

Erfert Fenton, Rob Hahn, Jim Heid, Dave Kosiur, Steven Levy,

David Pogue, Lon Poole, Steve Roth,

Charles Seiter, Franklin N. Tessler, Bruce F. Webster

Overseas Editors **Osmond Lind Iversen, Editor, Australian**

Macworld, tel. 02-439-5133; **Peter Worlock, Editor,**

Macworld (U.K. edition), tel. 01-831-9252; **David Ushijima,**

Contributing Editor, Japan

ART AND DESIGN

Design Director **Dennis McLeod**

Art Director **Joanne Hoffman**

Assistant Art Directors **Nancy Paynter, Kent Tayenaka**

Designer **Leslie Barton**

Designer/Informational Graphics **Arne Hurty**

Associate Designers **Andrew Faulkner, Hao Yuan Kim**

Senior Design Associate **Tim Johnson**

Design Associate **Martha Katt**

PRODUCTION

Director of Manufacturing **Anne Foley**

Production Manager **Claudia Dawn Smukler**

Advertising Billing Coordinator **So Fong Yip**

Advertising Traffic Coordinator **Annette Garcia**

President/CEO and Publisher, Macworld Communications, Inc. **James E. Martin**

Assistant to the President **Terri Edelman**

September 1990, Volume 7, Number 9

Macworld (issn 0741-8647) is published monthly by Macworld Communications, Inc., 501 Second Street, San Francisco, CA 94107. Subscription rates are \$30 for 12 issues, \$60 for 24 issues, and \$90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add \$18 per year for postage for Canada and Mexico subscribers. Add \$69 per year for foreign postage to all other countries. Second-class postage paid at San Francisco, California, and at additional mailing offices.

*99.999% E field attenuation from 20kHz to >200 MHz.
*Greater than 50% H field attenuation above 30 KHz.
NoRad Shield is a trademark of NoRad Corporation.



FastPath Users Are Now In The Best Company.

FastPath, the original LocalTalk to Ethernet gateway, is now part of the Shiva family of breakthrough multi-vendor networking products. We've agreed with Novell to assume exclusive manufacturing, marketing and support of all FastPath products. Which means FastPath users can count on the same great technical, upgrade and

warranty support Shiva customers have been getting for years. Plus exciting new FastPath products and capabilities in the future.

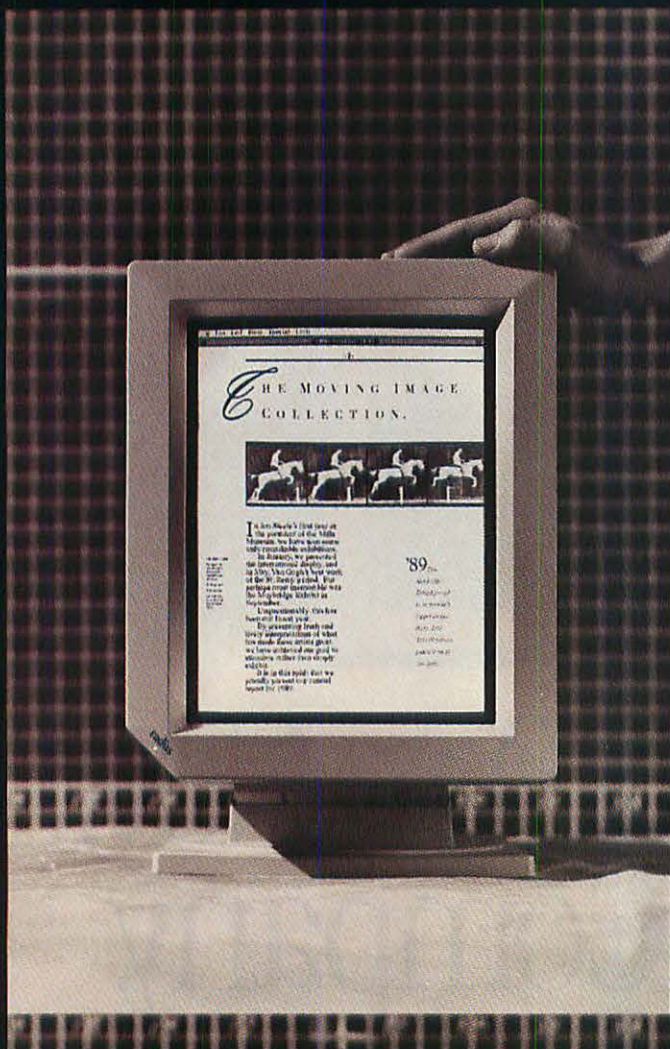
If you're a FastPath user, congratulations! As of now, you're in the best company. For more information about FastPath and other Shiva network communications products, call 1-800-458-3550.

FastPath 4
by Shiva

We're Putting Networks To Work[®]

155 Second St., Cambridge, MA 02141

FastPath licensing agreement between Novell, Inc. and Shiva Corporation effective June 1, 1990.
All product names are trademarks of their respective manufacturers.

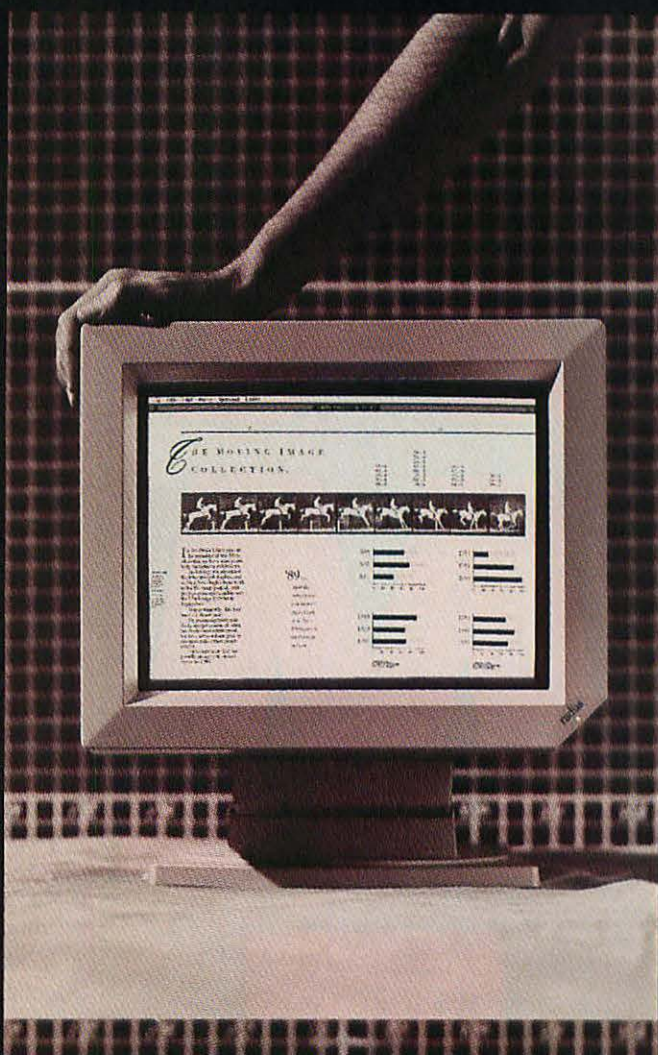
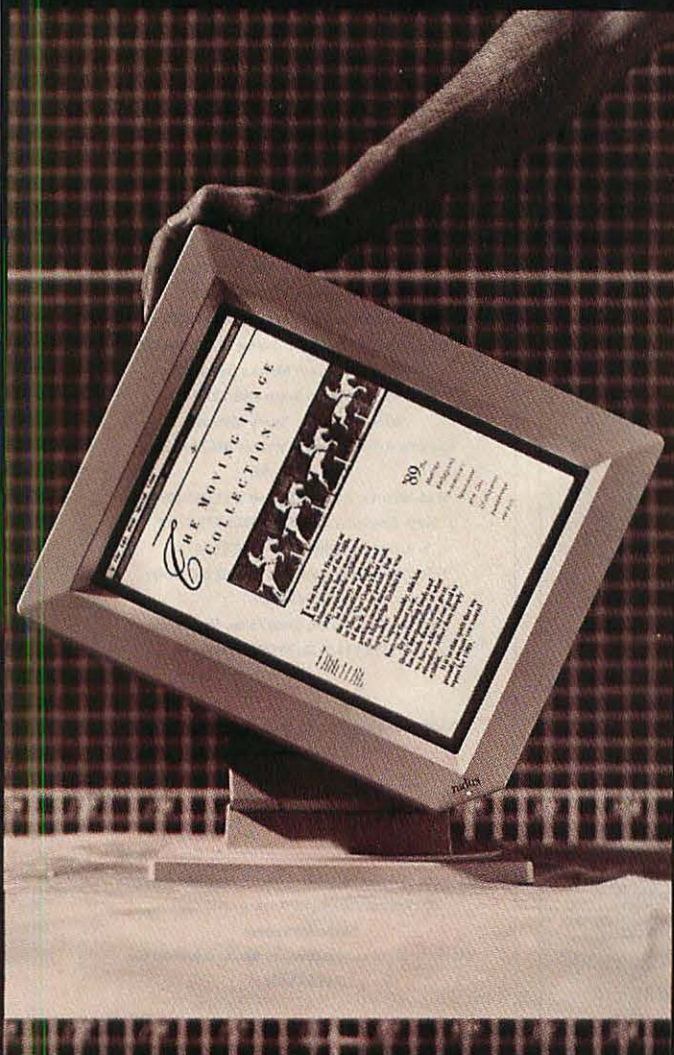


IF YOU'RE CONSIDERING AN APPLE MONITOR

Once again, Radius turns display technology on its ear. Introducing Pivot™, the first display that goes from portrait to landscape with only a gentle push. ● The new Pivot is the first display that changes orientation, in real time,

to match the format of your project. For example, when you're writing a manuscript, you can see a full page in portrait position. And when you switch to spreadsheets, you can rotate Pivot to view all twelve months. ● Four

radius™



HERE'S A NUDGE IN THE OTHER DIRECTION.

levels of gray are furnished, with upgrades to

16 levels for near-photographic quality images.

Ideal for graphic design and desktop pub-

lishing. ● Pivot is compatible with virtually

every Macintosh application and may be used

with either the SE/30 or Macintosh II family.

● To find your nearby Radius reseller,

phone 1-800-227-2795* Then, before you buy

a display for your Macintosh, check out another

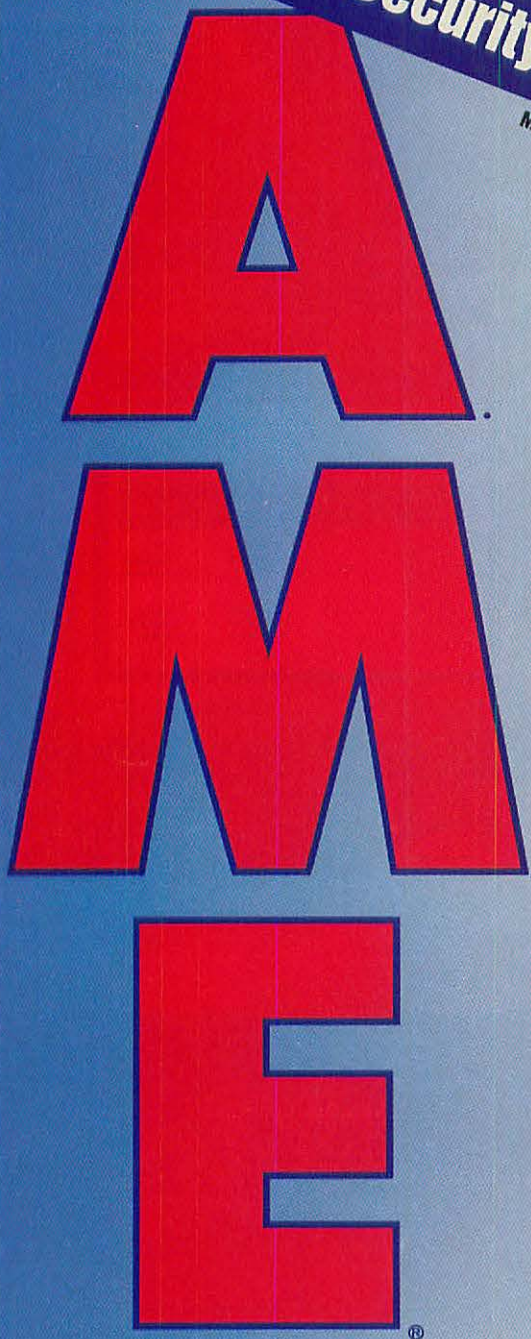
amazing way to look at things from Radius.

Circle 46 on reader service card

*If you live outside the United States, call 408-434-1010 for the name of a Radius International Distributor.
© 1990 Radius Inc. Radius, the Radius logo, and Radius Pivot Display are trademarks or registered trademarks of Radius Inc.

"A.M.E. sets New Security Standard"

MacWEEK 1/16/90



Security & Virus Protection

Logs software & hardware activities

Protects against illegal copying

Prevents launching of unauthorized programs

Multiple levels of Users with individual/group access controls

Specific Desk Accessory Control

Multiple encryption/password options

A.M.E. is an integrated security program. Whether your concerns are managing a confidential government project, maintaining order on a Mac™ used by many people, or just preventing your child from destroying financial records, A.M.E. has a solution for you. It runs quietly in the background and is always there to protect you. The easy-to-use interface lets you set up the Mac with just the kind of security you require.

Access Managed Environment

Call today for a Free Brochure 800 359-4920

Casady & Greene, Inc.

P.O. BOX 223779 • CARMEL, CA 93922 • 408 • 624 • 8716

Circle 16 on reader service card.

MACWORLD

ADVERTISING SALES

Vice President/Director of Advertising Sales
Patricia Navone (415/243-0505)

Western Advertising Manager William P. Peck
(415/243-0505)

Senior Account Manager/No. California (San Francisco) Penny Rigby (415/243-0505)

No. California (San Jose) Cherie La France
(415/243-0505)

Northwest Regina T. Salices (415/978-3155)
Sales Associate Shannon Smith

So. California Paul Dudas (714/250-1307)
Southwest, Texas Cathi Tucker (714/250-1307)

Sales Associate Marsha Bowers
Midwest Shannon Dolan (708/827-4477)

Sales Associate Sandy Mussato
Eastern Advertising Manager Bill Thompson
(201/967-1350)

Mid-Atlantic Annette Bromer (201/967-1350)
New England Joan Flynn (508/879-0700)

Southeast Kathy Isaacs (404/394-0758)
Telemarketing Manager Beverly Schneider

(415/243-0505)
Macworld Catalog Carol Felde, Niki Stranz
(415/978-3152; 415/978-3105)

Vice President/Marketing and Circulation
Daniel Orum

MARKETING

Marketing Associate/Reader Service Susan Carroll
Marketing Associate/Merchandising Lisa Espinoza

Marketing Associate/Communications
Kimberlee Luodeo

Marketing Associate/Events Randy Schneiderman
(415/243-0505)

CIRCULATION

Director of Circulation Lindsay Davidson
Fulfillment Coordinator Evelyn Adenau

Promotion Coordinator Lori Hitchcock
Circulation Assistant Catherine Huchting

Single-Copy Sales Director George Clark
Single-Copy Sales Rep Martin Garchar

MARKET RESEARCH

Director of Research Gary L. Rocchio
Research Coordinator Guy Tasaka

ADMINISTRATION

Director of Finance Vicki Pailen
Corporate Business Manager Christina W. Spence

Accounting Manager Pat Murphy
Director of Human Resources Shelly Ginenthal
Information Systems Manager Walter J. Clogg

Founder David Bunnell

Founding Editor Andrew Fluegelman 1943-1985

If you like your spelling checker, you'll love our sentence checker!

Introducing Correct Grammar for the Macintosh—the powerful word processing add-on that checks each sentence, highlights mistakes, suggests corrections... and helps you add clarity to all your writing.

Correct Grammar ain't bad!

★★★★½ **MacUser awards Correct Grammar 4½ Mice for top product in category.**

"...get Correct Grammar unless you have a specific reason for doing otherwise. It has fewer rules and features than Grammatik Mac but is more than adequate for most writers. It's also better behaved and has a much better interface. Correct Grammar is much easier to use than Grammatik Mac, requiring less clicking and mousing to reach the same ends, and it's also far less likely to do things that you neither want nor need done." —Steven Babker

No matter how hard you try to catch them, mistakes can slip into your writing.

You can fix spelling errors with your spelling checker. Other errors have been tougher to catch. Until now.

Now there's Correct Grammar for the Macintosh. It works like your own personal editor to correct mistakes in grammar, style, punctuation, usage... even spelling.

Correct Grammar makes your writing clearer and more precise. It saves you the embarrassment of having others catch your mistakes first.

Takes the "Oops!" out of your writing.

Without Correct Grammar, you can proofread too quickly and makes mistakes. (Oops!)

When a singular verb are called for, Correct Grammar lets you know. (Oops!)

It alerts you to incomplete sentences. Fragments like this. (Oops!)

Instantly, Correct Grammar identifies inconsistencies, split infinitives, awkward phrases, wordiness, clichés and other finer points of style. Then it suggests how you can correct them.

You can make the correction with a click of the mouse, leave it alone, or rewrite the sentence your own way.

If you wish, Correct Grammar will explain the grammatical rule that applies. So you can learn more about good grammar, every time you write.

You won't even have to check your spelling separately with your word proces-



System Requirements. Macintosh with 1MB of RAM and hard disk, System 4.2 or higher. Compatible with Microsoft Word 3, 4; MacWrite; MacWrite II; WordPerfect; WriteNow 2.0; Microsoft Works; Microsoft Write; QuickLetter; Acta Advantage; and any text-only document.

sor. Correct Grammar has its own spelling checker, with more than 130,000 words.

Lets you write in your own style.

No matter what type of writing you do, Correct Grammar can adjust to your personal style.

For example, Correct Grammar is programmed to remind you not to begin a sentence with "Or," "And" or "But." But if that's the way you want to write, you can simply turn that rule off, and Correct Grammar won't flag it any longer.

Helps you write at the right level for your audience.

You can even ask Correct Grammar to compare the readability of your writing, sentence by sentence, to the education level of your intended audience.

If a particular sentence is too difficult to understand, you'll know exactly which one it is—and be able to correct it on the spot.

Correct Grammar also gives you the Flesch, Flesch-Kincaid and Gunning Fog readability indexes required by the U.S. government and certain industries.

Guaranteed to catch 95% of your grammatical and spelling mistakes—or your money back.

See for yourself. Try Correct Grammar for two full months. If it doesn't make your writing sharper and more accurate, return it within 60 days for a full refund.

Take advantage of this limited-time offer before November 30, 1990 by calling

1-800-543-3873

Ask for Operator 711.

Or see your local software dealer.

FREE GIFT

The Vest-Pocket Writer's Guide

—based on The American Heritage Dictionary. A handy 250-page guide to more effective writing for business, home or school. Fits in your pocket!



MONEY-BACK GUARANTEE

☐ **YES!** I want my writing to be free of mistakes.

Send me Correct Grammar for the Macintosh to try for 60 days without risk—for only \$79, plus \$5.50 shipping and handling. (CA residents add \$4.94 sales tax.) By ordering before November 30, 1990, I will also receive the Vest-Pocket Writer's Guide as my FREE gift—mine to keep, even if I decide to return Correct Grammar within 60 days for a full refund.

☐ Check enclosed
☐ Charge to my: ☐ Visa ☐ MasterCard

CARD # _____ EXP. DATE _____

SIGNATURE _____

NAME (PLEASE PRINT) _____

COMPANY/INSTITUTION (IF APPLICABLE) _____

ADDRESS ☐ HOME ☐ BUSINESS _____

CITY _____ STATE & ZIP _____

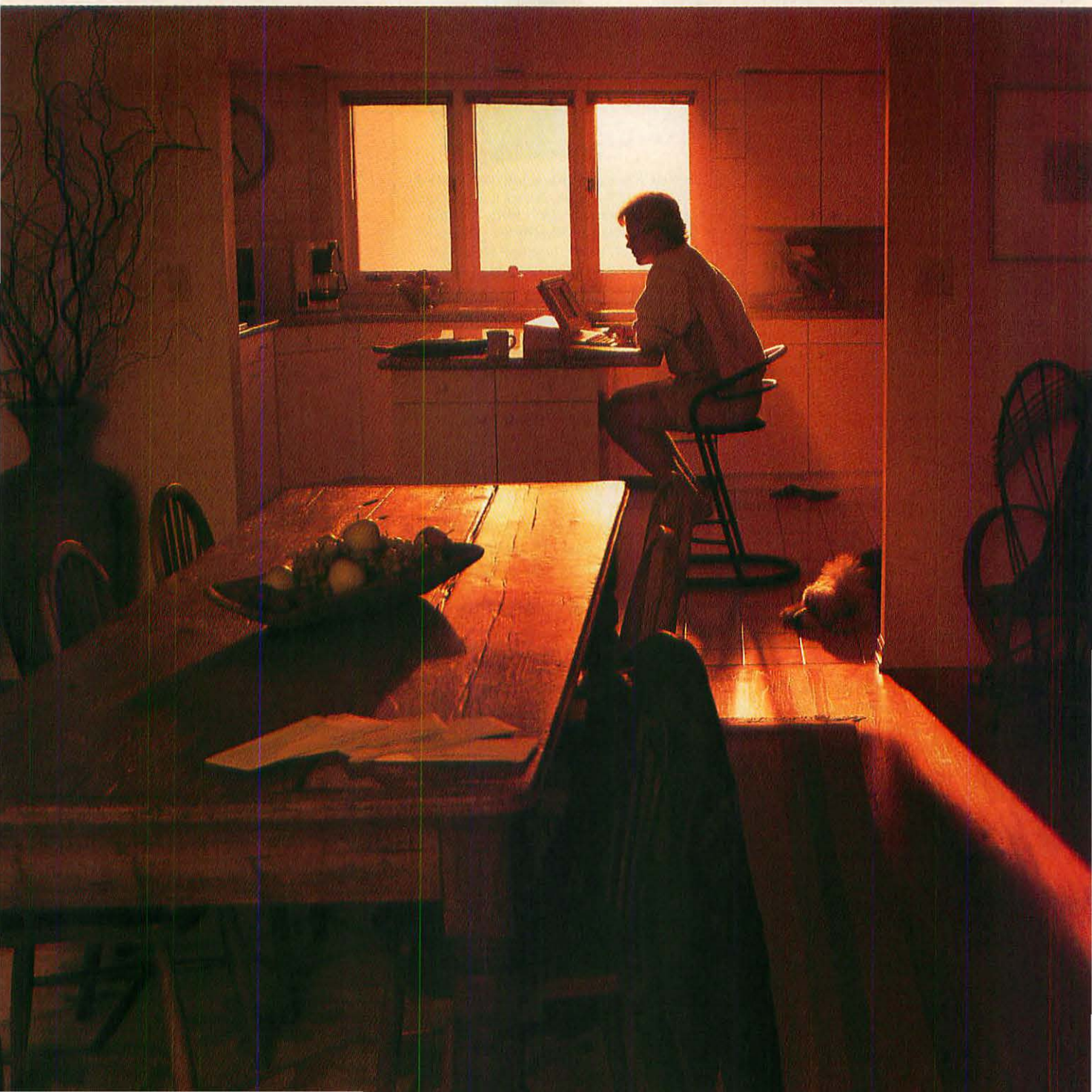
DAYTIME PHONE _____ WORD PROCESSOR USED _____

MAIL TO: Lifetree Software, Inc.
33 New Montgomery St., San Francisco, CA 94105
Or Fax: 1-415-541-7850. Allow 2 weeks for delivery.

 **Correct Grammar.**

Only \$79 when you order direct

The desktop Mac with more than



Macintosh for people in one desktop.

Think of it as the office Mac[®] you can take home with you. Or the Mac for the home that's capable enough to use at the office. Either way, this is the Macintosh[®] that gives you the freedom to work where you can get the most work done. The Macintosh Portable.

The Portable is, first and foremost, a full-fledged, completely compatible Macintosh. It's got the standard Mac keyboard, and comes with a page-width screen. It'll run all the same programs you're currently using, at twice the speed of our best-selling Macintosh SE. And, just as important, it plugs into any Mac peripheral.

There's also the added benefit that since you'll always be using the same computer, your desktop and programs will always be set up just the way you like them. Complete with the most current version of all your work.

For the name of the authorized Apple reseller nearest you, give us a call at 1-800-538-9696, ext. 725. And find out how to have the power to be your best.

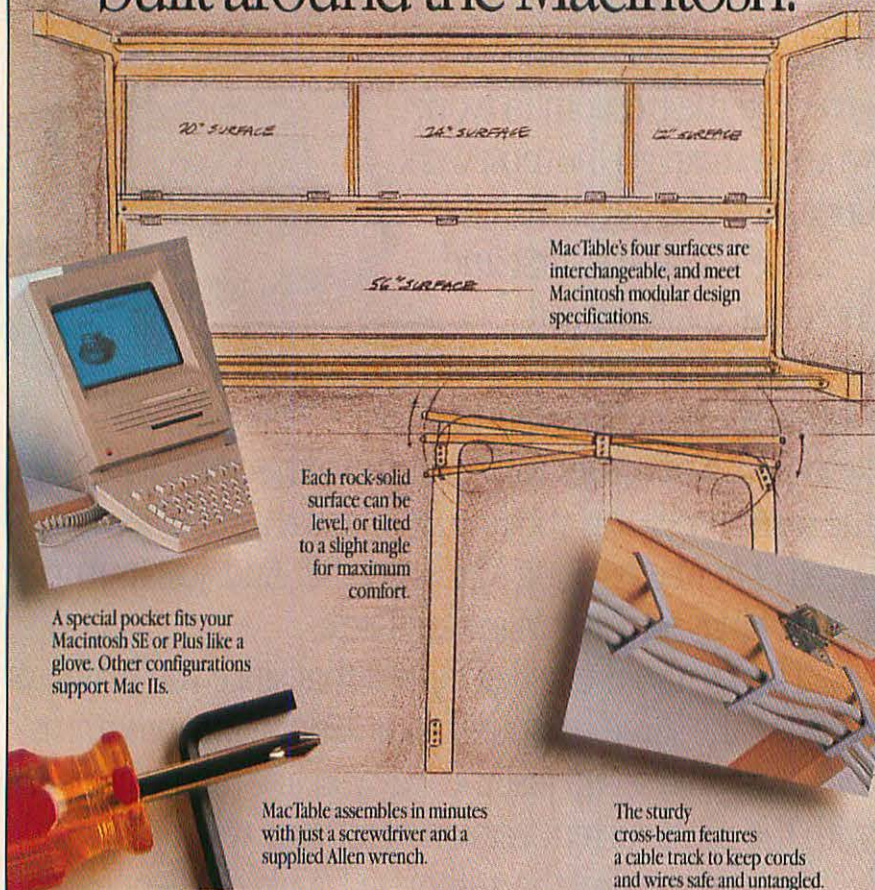
No matter which desktop you happen to be at.



The power to be your best.[™]



The only table built around the Macintosh.



All this and it's affordable, too.

58" MacTable.....\$339

46" MacTable.....\$299

Roll-away cabinet.....\$149

(fits under MacTable, or alongside to support LaserWriter)

30 day return guarantee.



To order MacTable:
or for more information,
call toll-free (800) 722-6263
or (206) 481-5434 in WA.



MacTable[®]

The ultimate Mac peripheral.



P.O. Box 3217, Redmond, WA 98073-3217

Prices do not include UPS shipping. MacTable design is patent pending. MacTable is a registered trademark of Scandinavian Computer Furniture, Inc. Macintosh and LaserWriter are trademarks of Apple Computer, Inc. Prices and design subject to change without notice.

MACWORLD

HOW TO CONTACT MACWORLD

Subscription Services

For subscription service questions, call 800/234-1038, 800/525-0643, or 303/447-9330, or write Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529. To place orders, call 800/288-6848.

Macworld on America Online

Macworld subscribers can contact Macworld editors online via the Macworld area on America Online. The area features reviews, news, new-product announcements, version information, a database of products, and Macworld-sponsored message boards and conferences. Several of our editors log on on a regular basis. To obtain a free America Online software kit, call 800/227-6364, extension 5254.

Macworld in Microform

Macworld is available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346, 313/761-4700.

Back Issues of Macworld

Write to: Back Issues of Macworld, 144 Townsend St., San Francisco, CA 94107; \$6 per issue (\$20 overseas). Prepayment in U.S. funds necessary.

Macworld Editorial

Mail or Courier Macworld Communications, Editorial Dept., 5th floor, 501 Second St., San Francisco, CA 94107; 415/243-0505.

AppleLink: Macworld1 Connect: Macworld1 CompuServe: 70370, 702 Fax: 415/442-0766

Letters to the Editor All your written comments, questions, and suggestions regarding any aspect of the magazine are read by our editor. We reserve the right to edit all submissions; letters must include your name and address. Direct all correspondence (by mail or electronically) to: Letters to the Editor.

Questions and Quick Tips Direct questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to: Quick Tips, Lon Poole.

Consumer Advocate Been burned? Really steamed? Direct your concerns (by mail or electronically) to: Conspicuous Consumer, Deborah Branscum.

New Products and Updates Direct press releases and product announcements (by mail or electronically), and shrink-wrapped software upgrades (by mail or courier) to: New Products Editor.

Editorial Calendars For a copy of Macworld's editorial calendar, direct requests (by mail) to: General Information, Editorial Dept.

Reprints and Photocopy Permission Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use *only*—for the flat fee of \$1.50 per copy of the article or any part thereof. Specify ISSN 0741-8647 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970. Address requests for reprint orders and for permission to copy editorial for other purposes to: Reprints and Permissions, Editorial Dept.

Writing for Macworld Please do not send us unsolicited manuscripts. If you're interested in writing for Macworld, send a stamped, self-addressed envelope along with a request for our writer's guidelines. Direct (by mail) to: Writer's Guidelines, Editorial Dept.

POSTMASTER: Send address changes to Macworld, P.O. Box 54529, Boulder, CO 80323-4529. For dealer inquiries, call 800/621-5461, in California 800/521-8455. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505.

Macworld is a publication of Macworld Communications, Inc. Macworld is an independent journal not affiliated with Apple Computer, Inc. APPLE, the APPLE LOGO, MAC, and MACINTOSH are registered trademarks and MACLETTER is a trademark of Apple Computer, Inc. Printed in the United States of America. Copyright 1990 Macworld Communications, Inc. All rights reserved. Macworld is a member of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 130 computer publications in more than 40 major countries. Nineteen million people read one or more IDG Communications publications each month.



Circle 296 on reader service card.

When It Comes To Viruses, There's No Such Thing As Overprotection.

Prevents both known and new viruses from infecting your Mac

Removes existing viruses, and repairs infected files

NEW! Includes a 24-hour Virus Newsline for new information and instant updates (A SAM Exclusive)

NEW! Tracks virus infection attempts to show the frequency and type of activity your system has experienced (A SAM Exclusive)

NEW! Checks any folder combination you choose at any time

NEW! Scans and ejects virus-infected floppies instantly

NEW! Inoculates and "locks" applications & INITs to increase protection against viruses

NEW! Expanded password protection to secure your configuration (A SAM Exclusive)

Eliminates false-alarms by "learning" the normal activity in your system that merely looks like a virus (A SAM Exclusive)

SYMANTEC.

Introducing Symantec AntiVirus for Macintosh (SAM™), Version 2.0.

The original version of SAM just locked up the 1989 Eddy as "The Best AntiViral Program" you can buy. Now with added protection and security, new SAM 2.0 is even more effective.



1989 MacUser Eddy Award Winner



And more essential. Because, when your business is at stake, no amount of protection is too much.

SAM finds and destroys all known viruses and clones. It also protects you from new, unnamed viruses by constantly scanning for suspicious virus-like activity. And only SAM 2.0 protects you with instant virus updates from our exclusive 24-hour Virus Newsline.

To keep viruses from ever becoming a problem, SAM keeps them out. SAM prevents any infected application from launching and spreading a virus, and detects "Trojan Horse" attempts to damage a disk. It checks every floppy or removable you insert, and just touch a hot-key to check files downloaded from networks or by modem.

Total protection. It makes SAM the best-selling, highest rated antiviral program ever created for the Mac. So get new SAM 2.0 today and relax. Because, with SAM 2.0, viruses can come knocking. But they can't get in.

SEE YOUR DEALER, OR CALL
FOR MORE INFORMATION:
(800) 228-4122 Ext. 651G



Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014, 408/253-9600.
MacUser Eddy awarded in March 1990, MacUser Five Mice rating awarded in October, 1989. SAM has been the best-selling AntiViral program since October 1989, based on Ingram Micro's, Kinfli, and Softtel best-seller lists. Current SAM users call 800/626-8847 in CA or 800/441-7234 outside CA about our low cost upgrade. Symantec Virus Newsline available in North America only. SAM and Symantec are trademarks of Symantec Corporation. © 1990 Symantec Corporation

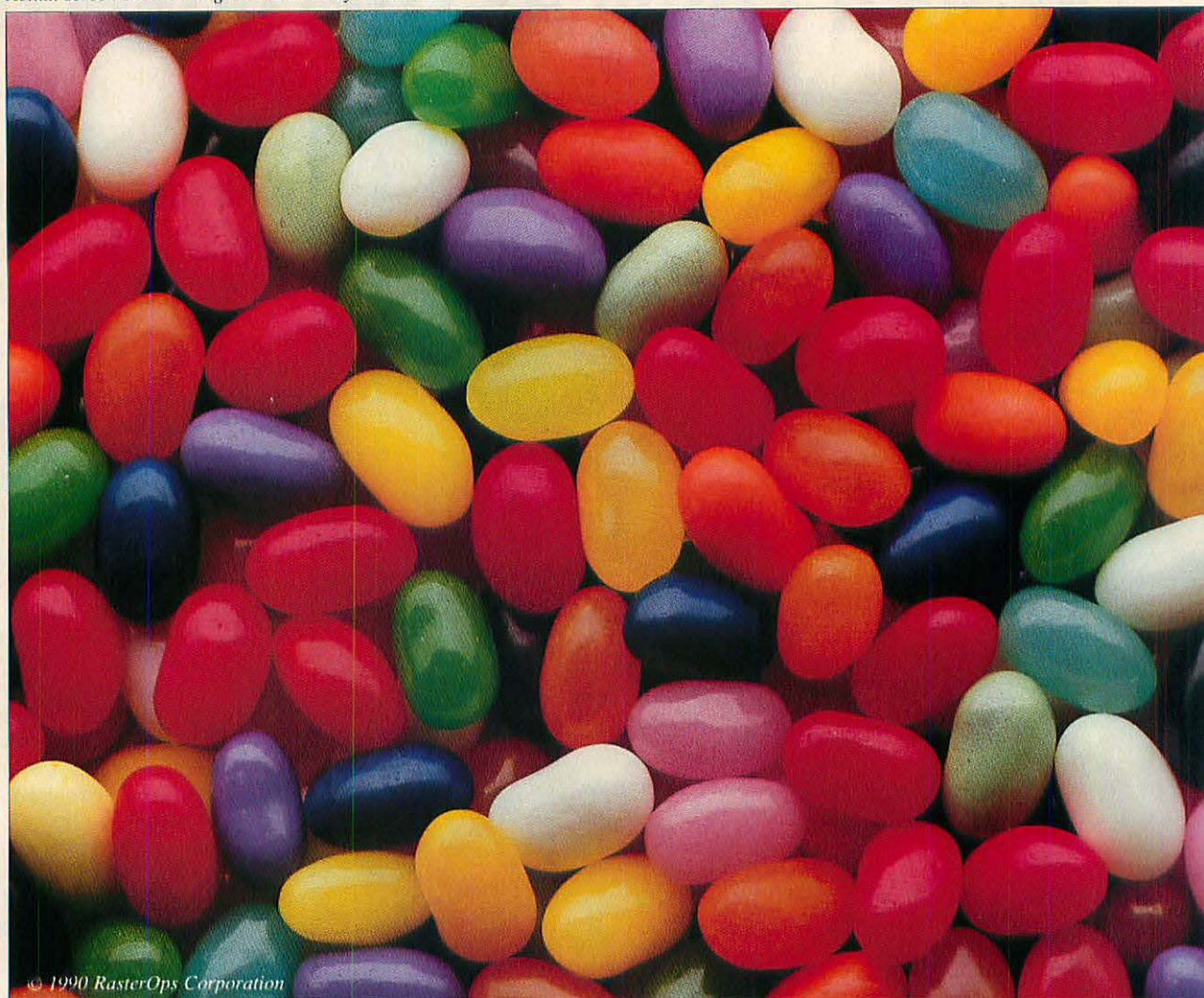
Circle 96 on reader service card



24L DISPLAY SYSTEM • CALIBRATOR DISPLAY SYSTEM • COLORCAD 228 SYSTEM

VIDEO EXPANDER • ADB TUNER • COLORBOARD 232 • CLEARVUE BOARD SE/APD • COLORBOARD 724 SYSTEM

Actual screen shown using ColorStudio® by Letraset®.



© 1990 RasterOps Corporation

TRUE COLOR FASTER THAN

There's nothing like the realism of 24-bit True Color. And now you can have it without spending half your life waiting for your screen to redraw. With the RasterOps® 24L display board and Accelerator board, you can work with graphic-intensive images like this up to 600% faster than ever before.



Now you can upgrade anytime. Or extend your warranty with RasterCare.™

And these are no ordinary images. After all, we invented True Color. This is the highest quality 24-bit color available. With the finest resolution for every size monitor: 13", 16", or 19". And multiple bit modes of 1, 2, 4, 8, and 24 give you every option from monochrome to beautiful True Color.



CLEARVUE/II SYSTEM • CLEARVUE/SE SYSTEM • COLORBOARD 708+/SE30 SYSTEM



RasterOps 24L & Accelerator



COLORBOARD 208 • SFX VIDEO OPTION • PROVIDED 32 • VIDEO COLORBOARD 364 • FRAMEGRABBER 324NC



YOU CAN SAY "JELLYBEANS".

Only RasterOps adheres to Apple's standard for acceleration. So now you can manipulate extra large images quickly with our unique on-board memory expansion of up to 16 MB.

And our NuBus block transfer allows for the fastest transfer of data. Which helps overcome bottlenecks inherent in the architecture of the NuBus.

That's a lot of technology on one card. But the 24L is only \$3995. And the Accelerator board is only \$495. Or, for only \$1995, you can buy our 8L display board, and upgrade later.

Just see your RasterOps dealer for a demo now. Or call 800.468.7600 to find out more. And get ready for some instant gratification.

RasterOps[®]

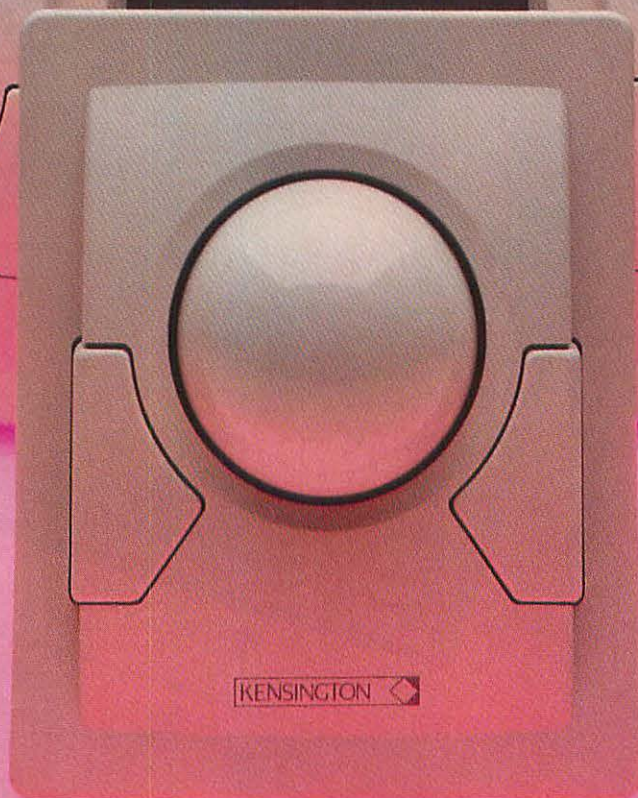
THE ART & SCIENCE OF COLOR™



**1987 Macworld
World Class Award**



**1988 Macworld
World Class Award**



**1989 Macworld
World Class Award**

Turbo Mouse. Wins again and again and again.

That's right. For the third year running, the readers of Macworld magazine have voted the Kensington Turbo Mouse® "Best Input Device" for Macintosh® computers.

Who were the contenders? Every other trackball and mouse on the market. (Not to mention joysticks, keyboards and graphics tablets.) The winning secret? Simple.

Turbo Mouse is quicker, quieter, and easier to use. It delivers the winning combination of speed, precision, two buttons

with extra features, and a comfortable, space-saving design—all for just \$169.95.

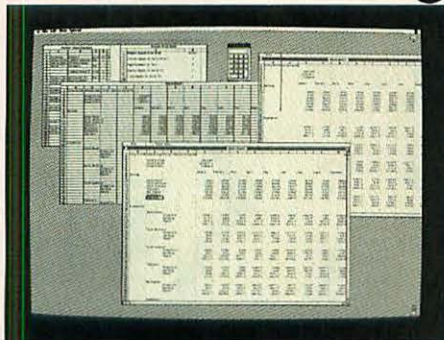
For a free brochure, or a dealer near you, call (800) 535-4242. Outside the U.S. or in New York, call (212) 475-5200.

Circle 392 on reader service card

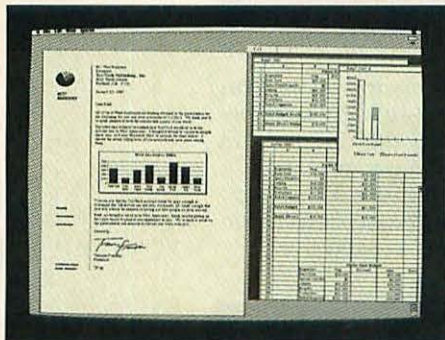
KENSINGTON®

**See us at Macworld
Booth 5312**

Why pivot when you can click?



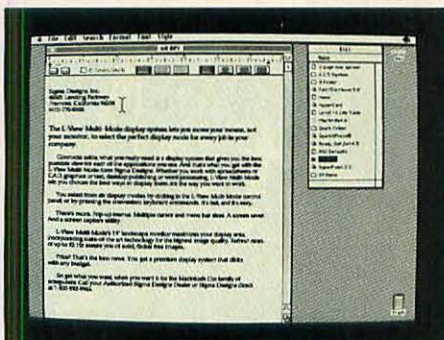
120 dpi for spreadsheets or CAD- just click.



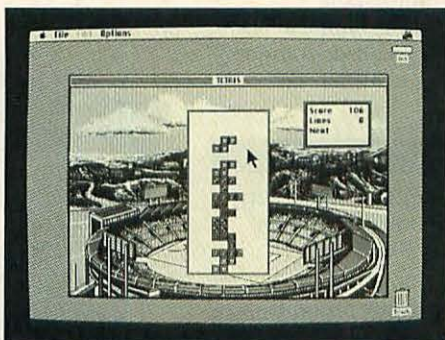
92 dpi for legal or A4 documents- just click.



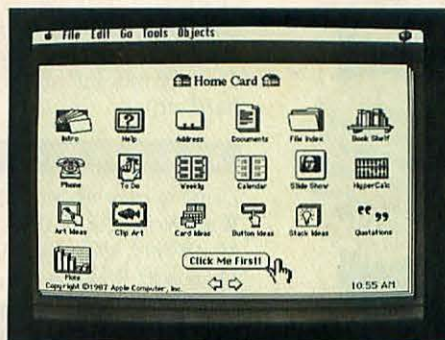
72 dpi for True WYSIWYG layouts- just click.



60 dpi for text entry- just click.



46 or 36 dpi for enlarged Macintosh 9 or 13-inch screen images- just click, click.



The 19" L-View® Multi-Mode™ display system lets you move your mouse, not your monitor, to select the perfect display mode for every job in your company.

Gimmicks aside, what you really need is a display system that gives you the best possible view for each of the applications you use. And that's what you get with the L-View Multi-Mode from Sigma Designs. Whether you work with spreadsheets or CAD, graphics or text, desktop publishing or word processing, L-View Multi-Mode lets you choose the best ways to display them...for the way you want to work.

You select from six display modes by clicking in the L-View Multi-Mode control panel, or by pressing the convenient keyboard commands. It's fast, and it's easy.

There's more. Pop-up menus. Multiple cursor

and menu bar sizes. A screen saver. And a screen capture utility.

L-View Multi-Mode's 19" landscape monitor maximizes your display area, incorporating state-of-the-art technology for the highest image quality. Refresh rates of up to 92 Hz assure you of solid, flicker free images.

Price? That's the best news. It clicks with any budget.

So get what you want, when you want it for the Macintosh IIx family of computers. Call your Authorized Sigma Designs Dealer or Sigma Designs direct at 1-800-933-9945.

46501 Landing Parkway
Fremont, CA 94538
TEL: (415) 770-0100
FAX: (415) 770-0110
TLX: 171240

**SIGMA
DESIGNS**

The L-View Multi-Mode control panel lets you change display modes at the click of a mouse, or with user-configurable keyboard commands.

© 1990 Sigma Designs, Inc. L-View Multi-Mode is a trademark of Sigma Designs, Inc. Macintosh is a registered trademark of Apple Computers, Inc. Specifications subject to change without notice.

See us at Macworld Bayside Expo #824

Dealers circle 62 on reader service card
End users circle 74 on reader service card

WriteNow 2.2

THE AWARD-WINNING WORD PROCESSOR OF CHOICE!

THE EASIEST-TO-LEARN & USE

If we were to pick one word that our customers use to describe WriteNow, it's *usable*. A great word processor is more than just a stockpile of features—it's the *usability* of those features, how easy they are to learn and use, and how they feel under your fingertips when doing *real work*. Everyone claims ease-of-learning and ease-of-use, but WriteNow actually delivers it—and our awards and ratings prove it.

FAST! FAST! FAST!

WriteNow is the *undisputed* performance champion. Editing, searching, spell checking, saving, and printing happen *lightning fast*. For big and small documents. On any Macintosh. With or without a hard drive.

MICROSOFT WORD COMPATIBILITY

Don't worry about document compatibility, WriteNow 2.2 is directly compatible with MacWrite, Microsoft Word 3.0, and Microsoft Word 4.0.

1.4 MILLION-WORD THESAURUS

Find just the right word with the largest thesaurus ever to ship with a Macintosh word processor.

135,000-WORD SPELLING CHECKER

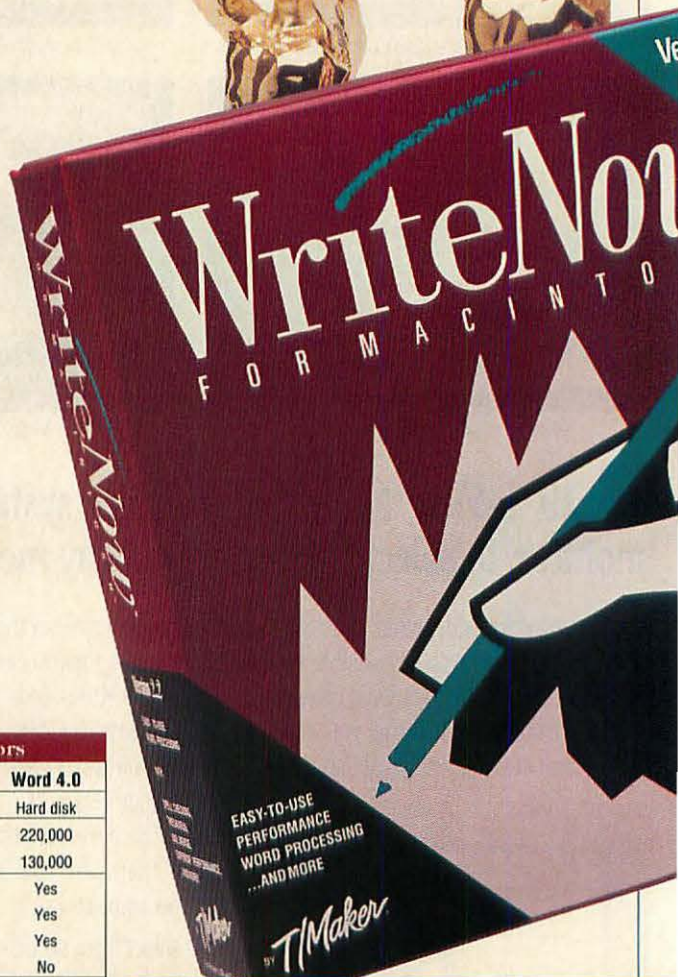
WriteNow also has the largest—and *fastest*—spelling checker of any Macintosh word processor.

WriteNow 2.2—still the word processor of choice!

Quick Comparison of Leading Word Processors

	WriteNow 2.2	MacWrite II	Works 2.0	Word 4.0
Disk space needed:	(2) 800K	Hard disk	Hard disk	Hard disk
Thesaurus (Size in words):	1.4 million	220,000	No	220,000
Spell Checker (Size in words):	135,000	100,000	60,000	130,000
Mail Merge:	Yes	Yes	Yes	Yes
Format Accelerators:	Yes	Limited	No	Yes
Multiple Header/Footers:	Yes	No	No	Yes
Extensive Undo:	Yes	No	No	No
Retail Price:	\$199	\$249	\$295	\$395

Speed Comparison Charts (in seconds)



ATTENTION MS WORD OR MACWRITE USERS!

T/MAKER WILL HONOR YOUR MACWRITE & WORD UPGRADE OFFER!

THIS IS A LIMITED-TIME OFFER. CALL TODAY FOR DETAILS!

Highest Overall Rating
Software Digest
Macintosh Ratings
Report (Vol. 3/No. 2)
February 1990

Highest Rated Macintosh Word Processor
InfoWorld Magazine
1989, 1988

Editors' Choice Award
"Best New Word Processor"
MacUser Magazine
1989, 1987

Readers' Choice Award,
Word Processing
MACazine
1989

Highest Rated Macintosh Word Processor
MacGuide Magazine
1989

#1 Rated Word Processor
in "PC Week Poll of Corporate Satisfaction"
PC Week Magazine
1989

T/Maker.

T/Maker Company • 1390 Villa Street, Mountain View, CA 94041 • Tel: (415) 962-0195 Fax: (415) 962-0201

All tests performed starting with a 12-page text document on a Macintosh Plus with a 20 megabyte hard disk. Full repagination performed when necessary. © 1990 T/Maker Company. All rights reserved. The following are registered and unregistered trademarks for the companies listed: WriteNow is a trademark of T/Maker Company; Macintosh, Apple Computer, Inc.; MacWrite, Claris Corporation; Microsoft, Microsoft Corporation; WordMaster; Franklin Computer Corporation.

Circle 332 on reader service card



MAC BULLETIN

Watching the Macs at Work

Two utilities for tracking and controlling how Macs are used have gone through changes recently. With Quota (formerly the shareware utility DoppieMaker), a network manager can limit how many copies of an application are launched (to avoid exceeding license agreements), prevent users from making unauthorized copies of applications, and compile usage reports. Pricing depends on network size. For more information, call Proteus Technology at 403/426-6794. SoftView's MacInUse records everything a Macintosh user does, and can monitor an entire network without users knowing. Version 3.0 adds the ability to record the names of data files used and to track several applications running under MultiFinder. It lists for \$99. For more information, contact SoftView at 805/385-5000.

MacNIX Talks UNIX with Macs

UniPress Software's MacNIX puts a Mac interface on access to E-mail and files on UNIX servers. Icons represent standard UNIX file types, binary files can be transferred both ways, and folder relationships are maintained in the UNIX directories. MacNIX provides print spooling and can run in its own partition under MultiFinder. MacNIX also provides terminal emulation and supports most Mac-to-UNIX server hardware, including Kinetics' FastPath and Cayman Systems' GatorBox. For more information, contact UniPress at 201/985-8000.

New Entry-Level Stat Package

FloStat, a new \$99 package named in honor of Florence Nightingale for her use of statistics to promote health care a century ago, combines mapping and graphics with statistical analyses, including one-way ANOVA, t-test, correlations, simple regressions, and others. Its Maplink feature lets you link data with maps in PICT format (it comes with a collection of maps), and it generates a variety of standard tables and graphs. For more information, contact Population and Society Research Center Software at Bowling Green University, 419/372-8648.

Touch Talks

Touch Communications and Infonet have announced products for accessing the emerging worldwide E-mail system based on the X.400 standard. Touch's Worldtalk, which requires a UNIX server somewhere on an organization's wide area network, is a collec-

tion of gateways connecting QuickMail, Microsoft Mail, and InBox Plus on the Mac; cc:Mail and Action Technologies' MHS under DOS; and SMTP and UUCP in the UNIX world. Infonet is developing a gateway to link Worldtalk with Infonet's Notice 400, an E-mail, fax, and telex system available in most countries. Infonet is also developing gateways from Notice 400 to MCI Mail and Atlas 400. For more information, contact Touch Communications at 408/374-2500 and Infonet at 213/335-2600.

Capture Upgrade Planned

Mainstay Software's screen-dump utility Capture is being upgraded to version 3.0. Users can set it to automatically scale a captured image by setting a percentage in the Capture Control Panel window, with a new option that can capture the cursor. The new version is being written for compatibility with Apple's future hardware and system software. Capture lists for \$79.95. For more information, contact Mainstay at 818/991-6540.

Fresh-Squeezed Images

Kodak is shipping Colorsqueeze, an application that compresses hard-disk-hogging 24-bit color images. Colorsqueeze's compression algorithm deletes redundant pixels and frequencies invisible to the eye, reducing 24-bit PICT and TIFF files to anywhere from 1/5 to 1/40 of their normal size with almost no visible degradation of image quality, according to Kodak. It takes about 40 seconds to compress a 768K file on a Mac IIcx, and a thumbnail representation of the original file accompanies each compressed file. Colorsqueeze lists for \$179. For more information, contact Kodak at 716/726-3437.

What's nu in Motion Control?

The Virtual Instrument Library for Motion Control from nuLogic is a set of programs for monitoring and controlling motion of test equipment, materials handlers, robots, and similar devices in three dimensions. The \$195 Library consists of more than 120 virtual instruments (software-only data-acquisition and control devices). The Library requires National Instruments' LabView 2 instrumentation program and nuLogic's \$1795 nuControl Board, a three-axis, servomotor controller board that operates devices. The nuControl Board is designed for Mac II-series machines and works with other appli-

(continues)



cations besides LabView. For more information, contact nuLogic at 617/444-7680.

VIDI's 3-D Plans

Visual Information Development (VIDI) is developing its next generation of three-dimensional design tools. 3DModeler, a \$595 upgrade to Dimensions Design, will add polar and linear duplication; extrusion along any angle or spline; click-and-drag handles on shapes; bezier splines; hierarchical grouping; seven 3-D primitives; and *loafing*, a function that creates curved-surface models from 2-D objects. VIDI is also working on a Dimensions Presenter upgrade called 3DProducer, and a \$95 set of surface textures for rendering in 3DProducer called Dimensions Materials. 3DProducer will list for \$595 and add a spreadsheetlike interface for controlling objects, light sources, and cameras frame by frame. For more information, contact VIDI at 818/918-8834.

Service Bureau Group to Form

The National Association of Desktop Publishing Professionals is planning to hold its first meeting in the Sheraton Towers' Commonwealth Room on Friday evening, August 10, from 7 p.m. to 10 p.m., during the Macworld Expo in Boston. The organizers hope the association will give the country's estimated 800 to 1000 service bureaus some clout with desktop publishing software companies and high-end hardware companies. They plan to address such issues as the industry-standard 90-day warranty on image-setters and the lack of diagnostic tools for image-setter owners. For more information, call Van Tanner at 919/855-0400 or Bill Crider at 602/798-3200.

Cloud Over the 68030 Clearing Up

In late June a federal judge granted a temporary stay that allows Motorola to continue selling the 68030 microprocessor, which is the central processor for the Macintosh SE/30, IIfx, IICx, IICi, and IIfx. Previously, another federal judge had ordered Motorola, based in Schaumburg, Illinois, to stop selling the 68030 because it infringed on patents held by Japan's Hitachi. A spokesman for Motorola said the two companies had asked for the stay jointly as part of a "framework of an agreement," between Motorola and Hitachi. The spokesman would not comment on the terms of the pending agreement.

Apple Talks It Up

In a move likely to promote AppleTalk as a computer-industry standard, in June Apple Computer announced plans to license the source code to developers. The licensing will allow non-Mac vendors to take advantage of AppleTalk as an existing low-end networking standard. The fee for the object code is \$10,000; for the source code, \$40,000; for the source code with the right to sublicense, \$40,000, plus \$20,000 for each sublicensing. Apple will charge a \$500 annual maintenance fee for upgrades. For

more information, contact Apple Software Licensing at 408/974-4667.

HP Cuts DeskWriter Price

Hewlett-Packard announced in July that it cut the price of its HP DeskWriter ink-jet printer by \$200 to a list price of \$995. The DeskWriter, which started shipping in July 1989, is a 300-dpi resolution, Quick-Draw-compatible printer. For more information, contact Hewlett-Packard at 800/752-0900.

Apple Comings and Goings

Apple Computer announced in late June the appointment of Robert Puette as president of Apple's USA division, and the departure of Donald P. Casey, vice president of networking and engineering. Puette, who started his presidency in July, was general manager of Hewlett-Packard's PC Group from 1981 to 1990. Casey, who had been with Apple since 1984, left to become vice president of Lotus Development Corporation's new spreadsheet division.

Claris: To Apple Forever

Apple has apparently decided to keep a tight grip on software development for the Macintosh. In 1987 mounting pressure from other software vendors convinced the hardware company to stop selling Apple-labeled software and to create Claris as a subsidiary with an eye to spinning it off as a separate company. Apple now plans to keep Claris, which is believed to be the second largest Mac software vendor after Microsoft. (As a subsidiary of Apple, Claris does not release its own sales figures.) Apple CEO John Sculley said Claris will continue to develop applications and will begin to develop "extensions" to Apple system software and tools for multiplatform connectivity. Claris may license the latter to third-party developers. Bill Campbell, who was with Apple before Claris was formed, will continue as Claris CEO.

Lotus Wins Interface Suit

Lotus Development has won its look-and-feel copyright infringement suit against Paperback Software International. In the late June decision, U.S. District Court Judge Robert E. Keeton stated that copyright protection applies to the graphics, menus, and commands of a software product, not just to actual program code. Wrote Keeton: "The user interface of 1-2-3 is its most unique element, and is the aspect that has made 1-2-3 so popular. That defendants went to such trouble to copy that element is a testament to its substantiality." Lotus's victory is likely to have a major impact on Apple's pending suit against Microsoft for alleged infringement of the Mac interface by Microsoft Windows. The week after the judgment, Lotus initiated similar lawsuits against Borland, which markets the DOS spreadsheet Quattro, and the Santa Cruz Operation, which markets the UNIX spreadsheet SCO Professional. ■

The Macintosh® Gives You The Power To Be Your Best...



MegaMac™ Makes It Affordable.

These days it seems like Apple is introducing computers quicker than you can say 'M-a-c-i-n-t-o-s-h.' Trouble is, most of the new Mac models sport some pretty lofty price tags. And that, of course, only puts 'the power to be your best' further out of reach of most Mac enthusiasts. At least until now...

Introducing the MegaMac™ Solution.

Here's good news for aspiring Macintosh power users everywhere. Connect a NewCo Technology 50MHz MegaMac™ to your existing Mac SE/SE 30 or any Mac II and you may never again have to bow your head in reverence to a faster and more expensive Mac.

The combination of your Macintosh and the NewCo MegaMac can outperform the fastest Mac available including the new IIfx. That's astonishing considering the MegaMac costs a lot *less* than a IIfx. Plus, with a MegaMac, you can upgrade your system anytime you need extra performance... without ever having to scrap a single piece of Mac hardware. You'll never again have to worry that the Macintosh you just plunked down big bucks for is no longer 'top drawer'.

Apple Should Have Invented This.

If you're thinking the MegaMac is just another 'accelerator' board, think again. The MegaMac is a totally self-contained *CPU Performance Extender* — with its own memory, microprocessor and power supply. There's even an internal, 'fx' style Processor Direct/NuBus expansion slot and dual compartments for installation of up to 400 megabytes of high performance disk storage.

Unlike some old-fashioned accelerator boards that require tricky Macintosh circuit modifications, the MegaMac connects to your Mac via a snap-in NuBus accessory card. There's no soldering, no voiding your Apple warranty and no complicated software to install. Just plug it in, switch on your system and enter a whole new world of 'power' computing.

Premium Performance, Not Price.

The secret to MegaMac's astonishing performance is its proprietary design. A 50MHz 68030 microprocessor combined with 64K of 12 nanosecond write-through™ cache memory and up to 64 megabytes of high speed dynamic RAM provides blistering fast program execution. The result? Productivity gains greater than you ever imagined... all for much *less* than the price of a Mac IIfx!

The Guarantee Is Even Better.

Should your MegaMac ever require service, just return it to the factory for a no-charge repair for up to three years from date of purchase. NewCo can afford to back the MegaMac this well because it's been making microcomputer products longer than Apple — nearly 18 years now!

The next time you feel humbled by the price tag on one of Apple's shiny new Macs, call us at **1-800-662-9005** to arrange a MegaMac 31-day money-back evaluation. Or, if you prefer, send us a sample diskette of some of your toughest, most time consuming computing tasks. We'll show you how the MegaMac™ can make 'being your best' a whole lot better... not to mention a lot less expensive.



NewCo Technology, Inc.



The Mac IIcx & the NewCo MegaMac.

A Better, Less Expensive Way To Be Your Best.

**AFTER AUGUST 8,
YOU'LL THINK TWICE
ABOUT REMOVABLE
MASS STORAGE.**

AFTER AUGUST 8, YOU'LL THINK TWICE ABOUT REMOVABLE MASS STORAGE.

*Come to MacWorld Expo Booth #1830, or if you simply can't wait, call 1-800-777-4179.
The makers of Bernoulli will have you seeing double.*



Circle 260 on reader service card

Get it together.

"See workgroups differently with QuickMail 2.2."

"Connect with Paris as easily as Purchasing."

"QuickMail™ users have redefined workgroups to include co-workers and clients, partners and prospects, folks down the hall or up and down the coast. It's collaborative computing with point and click simplicity. Send a message, a document, or a whole file to everyone you work with. Connect through commercial online services, remote QuickMail networks or with any fax in the world with one key-stroke. Add gateways to your mainframe, VAX™ or NetWare MHS™ TCP/IP, or X.400 networks just as easily. No other E-mail offers you this many connections."

"Get the features that really make E-mail deliver."

"Features that make your extended workgroup easy to manage: A mail log tells you the status of all your mail— who's read it, who hasn't. Sort mail and file it in personal

mail folders so you can track conversations or projects. Retrieve messages or even 'unsend' them."

"And features that make it easy to work. The QuickMail Menu™ is always there so you can send a quick message, attach your open document or up to 90 seconds of voice mail, set up an impromptu online conference, post a notice to your whole directory or a pre-set group, or send mail for delayed delivery all without leaving your application."

"No wonder it's the world's most popular."

"QuickMail is working for over a quarter million users in 60 countries. It got the highest E-mail rating for PC or Mac from InfoWorld, who states, 'CE Software's QuickMail reigns supreme as far as features go.' MacWeek says, 'CE Software is far ahead... offering links to more than a million E-mail users.' From MacUser, 'QuickMail is the one you should pick.' Get the message?"

"Go to a dealer and try it."

Versions for the Macintosh® and PC. Suggested retail price: Version 2.2, 10 user pak: \$499.95. Free literature and where to buy: 1-800-523-7638, Dept. CE34.

QUICKMAIL



CE SOFTWARE

CE SOFTWARE INC

Connecting people and productivity.

P.O. Box 65580, West Des Moines, IA 50265 USA. QuickMail and QuickMail Menu are trademarks of CE Software, Inc. All other registered and unregistered trademarks are the sole property of their respective companies.

Circle 338 on reader service card



What It's Like to Buy a Mac Product

WHY SO MANY PEOPLE SWITCH TO MAIL ORDER

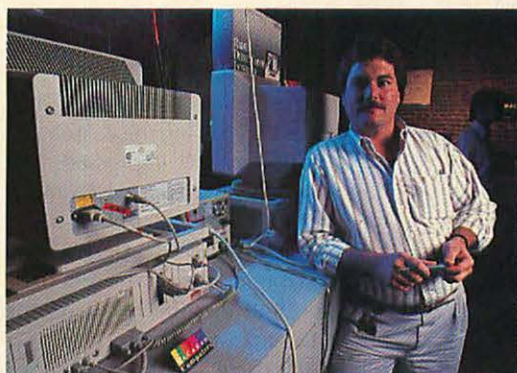
BY JERRY BORRELL

In the spring a young man's thoughts turn to . . . software. That probably says something more about me (not so young) than it does about amour. For months now, I have been looking for an opportunity to visit computer stores and see

what is happening there. Too frequently press types forget what it's like for the average person who has to buy computer products. I wanted to remember.

So on one of San Francisco's all-too-infrequent bright mornings I set out to explore the world of Macintosh as seen through the eyes of people who visit computer stores. I started off for the dealer nearest my home, the Egghead Discount Software store on Lombard Street. That's the street that leads to the Golden Gate Bridge. I've always thought of that end of town, near the bridge, as the end of the earth, or at least where you begin the journey to the state of mind known as Marin County. I wasn't expecting much as I pulled out of the traffic rushing to the bridge and parked next to the store. I pulled on the store door and . . . it was locked. *Good grief, they don't open till 10 a.m.,* I thought. *What in the devil am I going to do till they open?*

I avoided the magazine store nearby, where I knew I could lose the entire morning, and instead bought some coffee and walked for a while.



Tom Santos's Macadam is a store for real people.

By the time I returned two others were waiting. Together we paced. *An auspicious start,* I thought, *people waiting at the door for the store to open.* One store window contained huge posters for Windows 3.0 and some Microsoft cartons. Another was empty, forlorn looking (waiting for Windows applications, I guess).

By the time the store actually opened there were four of us waiting to get in and do something involving computers. *Franchise,* I thought as soon as I was inside. Everything had a place. Every square inch was planned.

It was like a video-rental chain—my expectations went down a notch further. Egghead stores, apparently, are divided into accessory areas at the front of the store, IBM software in the second third, and Apple/Mac in the back. Under a card labeled Apple/Bu-

iness was education software for the Apple II. Under a Mac business label was Mac music software. Never mind, I had found my section. Software at Egghead is organized by subject area. It's not indicated by any label, but there is a logic to it. Microsoft and Claris labels dominated the shelves, but there were other products to be found. In word processing Microsoft Word, MacWrite II, and WordPerfect were visible. Write-Now and Nisus were missing.

As I perused the shelves, two other customers found their way to the Mac shelves as well—and immediately picked up Coda Music Software's Finale. Chatting away in a Scandinavian language, the couple turned the box over several times. Then a young man arrived, a store employee. "Is this version 2.0?" they inquired. The staffer responded politely that it could be determined by opening the package and looking at Get Info under the File *(continues)*

CALL AMERICA'S
PRINTER
PROS

QMS 810PS
 • NT™ class
 • Latest version
 • High-end PostScript
 • 2MB upgradeable
 • IBM and MAC compatible
 • 39 PS Adobe™ Fonts

\$2999

QMS 810 TURBO
 • All the features listed above in a **FASTER**, higher performance NTX class printer

\$4488

Introducing the **NEW QMS™ COLORSCRIPT**

- High quality color PostScript™ printer
- 16,800,000 brilliant colors!
- Top rated performance

SPECIAL INTRODUCTORY PRICE
\$7888

Be sure to ask about MacFRIEND's cash saving Business LEASING programs.

NEW!
 Texas Instruments **microLaser**

- True Adobe Postscript™
- 300 DPI
- Optional AppleTalk™
- 17 Fonts
- 250 Sheet capacity
- Smallest footprint - 1/3rd the desk space!

SPECIAL PURCHASE
\$1888

Mac Friends

Call the Nation's Printer Experts before you buy! We handle most makes (& colors) and we'll "tell it like it is!"

I'D LIKE MINE IN METALLIC LAVENDER, PLEASE.

800 331-1322
 ...or use our QUICKFAX (503) 255-0067
 ASK ABOUT OUR 2 YEAR EXTENDED WARRANTY



ComputerWare sells only Mac-related products.

menu, which he did. At this point I edged closer to the conversation. "Version 1.2," said the male half of the couple. "Do you know where we can find 2.0?" And to my surprise, the Egghead staffer responded, "There's a music software store down on Mission; they'll probably have it. I'll call down there and check for you."

That pretty much won me over—this guy was passing over a sale of a few hundred dollars. Another customer found his way to the Mac software. "Hey. Do you have a spell-checker for the Mac?" he asked. A quiz followed, the salesman inquiring what word processor he used (MacWrite 4.0) and what he needed to do. "Thunder will do it. It's a DA that will run with MacWrite."

That told me a lot. The salesman didn't give a pitch for MacWrite II, which has a powerful spelling checker. He focused on solving the customer's problem. I was still impressed. The phone rang—it was someone wanting to know how to print a page on a 3 by 5 card from a Mac DTP program. That stumped the salesman, who asked the manager, and they both got on the phone to suggest a solution.

At that point I had to ask myself why they bothered to stock IBM products at all since they were only doing business on the Mac. The answer of course is that Egghead is a franchise. They have stores all over and lots of PC users, so there would be periods when all the customers wanted PC software. I was surprised to see that PageMaker was not being shown, so I asked. "Oh, they announced 4.0 so we pulled all of the 3.0 off the shelf and sent it back to them," the salesman said. "We'll get 4.0 in a few weeks."

This kind of approach is not what I had anticipated. I expected a kind of Gothic horror story in which people walked into stores, were abused, given

bad advice, and sent out in a state of confusion—my own experience in the past. The day was still young, but I left the store hopeful. Polite, knowledgeable, helpful staff selling lots of current Mac products.

A Factory Tour

I set off for downtown San Francisco. In the heart of the city's financial district, opposite the Pacific Stock Exchange. Tall buildings. No parking. Cold wind blowing down concrete and glass canyons. Across from the exchange is a Computer Factory store. Inside was a cavernous space broken up occasionally by a desk where busy people sat on the phone, typing, talking to one another. No customers at all—but there was obviously business being done. In the back was a wall of shelves covered with software. On closer investigation the wall looked like a Soviet department store—lots of the same products in different places. Maybe 15 different software packages perched on the shelves. Microsoft and Claris dominated the space. And Ashton-Tate's FullWrite, with a prominent yellow tag announcing the special price of \$395.

That reminded me of a computer store in Cupertino, on De Anza Boulevard, in view of the Apple skyscrapers (tall buildings are a relative thing in Cupertino), that seems to take pride in stocking products from defunct developers. I'm always furious at the thought of people buying a product for which there will be no technical or customer support.

I walked around the Computer Factory's kiosklike area that housed Mac products. An SE, a Radius monitor, Apple scanner, HP printer, Apple CD player, and a Mac IIx (not turned on). Also some promotional materials for Microsoft. No one asked if I needed help. No one seemed to notice me. Cartons of computer products on hand trucks were shuttled by. It was nice to be able to browse around, but it wasn't the same feeling as walking around in a bookstore where you enjoy being left alone—rather, I felt ignored. I could tell that things were happening in the store. I could see an area where training takes place. I imagine the store provides wonderful sup-
(continues)

ITS SPEED IS FEROCIOUS. ITS VERSATILITY, UNPRECEDENTED. IT'S UTTERLY PRECISE, ASTONISHINGLY NIMBLE, & INCREDIBLY SMOOTH AT THE HELM. THE PLANE'S NOT TOO SHABBY EITHER.



It's no accident that the high performance of Canvas™ evokes images of a jet fighter in full flight.

Fact is, its technical drawing power renders Canvas remarkably adept at evoking almost any kind of image you could want.

Over time, this has served to render Canvas's competitors rather speechless. And its reviewers, just the opposite.

A quick tour of its amazing arsenal of weapons helps explain why all the commotion.

Advanced Bezier and spline curves with total editing control. 64,000 dpi accuracy. 16 million-plus colors. Custom rulers, dashed lines, and arrowhead styles. 1/1,000th inch hairlines. Auto object distribution and dimensioning of lines & arcs. Auto tracing of scanned art.

Press-ready 4-color (CMYK) separations, with precision.

Circle 346 on reader service card

screen angle adjustments and independent color overrides. Flexible EPSF export formats. Importing of MacDraw® I or II files. Smooth text handling and a 100,000 word onboard spell checker.

The list just goes on. And on. And on.

Yet despite all this technical prowess, Canvas has earned consistent applause for its intuitive design & ease of use.

And, perhaps best of all, for its list price of under \$300.

So, if you're looking for a lot more thrill and a lot less limitation, look into Canvas.

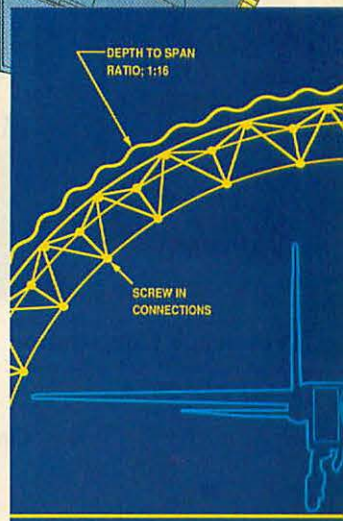
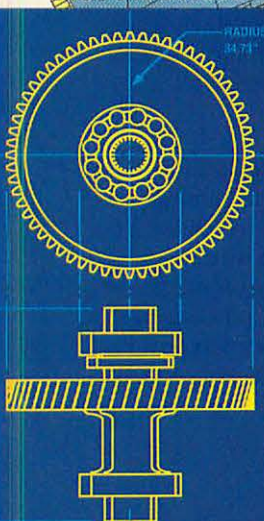
By any measure, it's the only way to fly.

For additional information on the name of your nearest dealer call 1 (800) 6-CANVAS or (305) 594-6965.

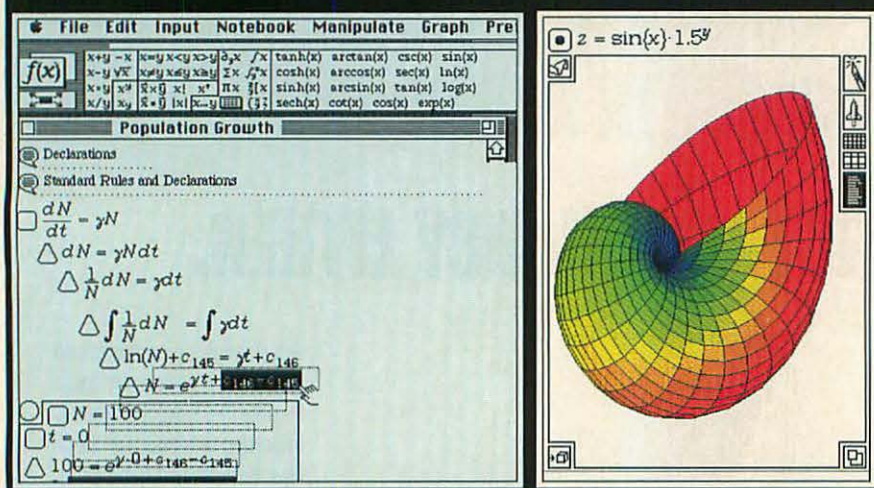
© 1990 Deneba Systems, Inc. Canvas™ is a trademark of Deneba Systems, Inc., MacDraw® is a registered trademark of Claris Corporation.

All illustrations were created in Canvas and separated by the Canvas Separator.™

CANVAS
PRECISION DRAWING POWER FROM
Deneba SOFTWARE



Intuitive Tools For Mathematics



Theorist's equation outlining and manipulation process, and one of many customizable graphs.

Prescience (pronounced PRE-shence) brings you the complete mathematical solution for the **Macintosh**: Theorist and Expressionist. Theorist is the symbolic algebra and graphing program that is easy to use and powerful, but only requires one (1) megabyte of memory. You don't need to learn how to program, memorize syntax rules, or read a large manual since Theorist actually displays and interactively solves real equations on screen—step by step—the way you do on paper. 2-D and 3-D graphs, contour and density plots, solids, as well as animation files, are easily created and saved in PICT, EPS, or PICS formats for high quality output. Your equations can be exported to Expressionist, the leading equation editor, for typeset-quality results in your word processing and page layout documents. Both programs are simple enough for the student, yet powerful enough for the professional educator, scientist, and engineer. Our programs enable you to concentrate your time investigating and presenting your information or to work, not learning how to! For more information or to place an order, call or write to the address below.

Expressionist® \$129.95
Typeset Quality Equation Editor

Theorist® \$379.95
Symbolic Algebra & Graphing



"[Expressionist]
Equation manipulation
has never been easier."
— Five mice review,
MacUser magazine

"Theorist... surpasses
the highly rated
Mathematica... in
interface and
execution."
— MacUser magazine,
Editors' Choice Award,
Best Math/Statistics
Program of 1989

Prescience Corporation
814 Castro Street #102, San Francisco, CA 94114
(415) 282-5864

Prescience
Intuitive Tools For Mathematics

port for customers in large companies, but it felt as if their business was business, not computers.

Egghead Redux

Then I went to another Egghead store—one I had always wanted to visit because of a celebration lunch I'd had with Victor Alhadeff, one of the founders of the chain, the day it opened. The store was really jammed with accessories up front. Lots of suits on customers. This store was different from the first. It had computers for sale as well. Back in the Mac section, two women stood conversing over a PC clone of some sort. The saleswoman was explaining to the customer that because IBM computers were cheaper you could get more computer power for your money. And the interface that made the Mac so useful was now available on the PC. I peeked over her shoulder at the Windows screen—at the muddy icons and folders. The saleswoman went on to tell the customer about all five of the applications available under Windows 3.0 and to say that more would be available in September. The customer asked something again about a Mac and received another answer about the PC. Nearby sat a Mac II, not even turned on.

In another aisle a man in a business suit was asking about OCR software for the Mac. The salesman's reply was "Do you have access to a PC?" "No, I want to read documents for my Mac." "Well, we have this scanner," the salesman pulled out one of the new hand-held scanners, "but it's really for pictures." "Do you mean that there is no software that allows me to do OCR on the Mac?" I gently interrupted and offered the names of several Mac products that allowed for OCR input and suggested that a flatbed scanner would be needed, then disengaged myself from the conversation.

More Visits

Next door to this Egghead is a Tek Computer store. Dark, a little gloomy. There were PC clones on tables. A few printers. And Macintosh boxes. Old MacPaint boxes were on the shelves. Real old. Boxes that proclaimed that the product could be used on a Plus, a Mac XL, and a 512K Mac. And Mac-

Circle 29 on reader service card.

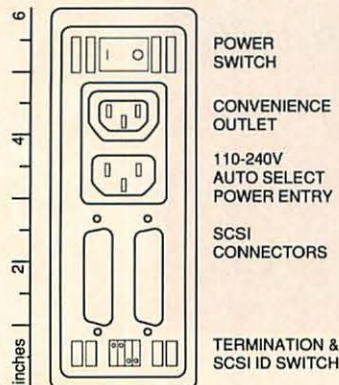
REPORTS INDICATE A POWERFUL NEW WAVE WILL SOON ENGULF THE COUNTRY



Tsunami drives from La Cie

"La Cie gives your hard disks a Silverlining." - MacWeek 1990

- National onsite service by **TRW**
- 20-210 megabytes
- Seek times as low as 15 ms
- Toll-free technical support
- Portable, approximately 3 lbs.
- Silverlining included
- Up to five year warranty



"La Cie offers the leading combination of software and performance." - MacWorld 1990

Call (800) 999-0143 for your free Tsunami information kit. Dealer inquiries welcome. International or U.S. call (503) 691-0771. Fax: (503) 692-8289 See you at Macworld

LaCie LTD.

Connect

Wang and Macintosh

VsCom/Macintosh—The industry standard Wang VS 2110 terminal emulation and file transfer software is now available for the Apple Macintosh, including complete support of the user interface standard.

VsCom connects locally and remotely through Wang VS ADC, EADC, MLTC or WACS communication ports.

Wang VS function keys are accessible through continuously displayed icons, the Macintosh extended keyboard, or regular keyboard aliases.

Powerful Script Command files can completely automate the Wang VS terminal access.

Two-way transfer of documents and files between the Wang VS and the Macintosh are easily accomplished with VsCom/Macintosh.

Document conversions include MacWrite, Microsoft Word, WordPerfect, and DCA Reviseable Format Text.

Wang documents supported include Wang Standard word processing and WP Plus.

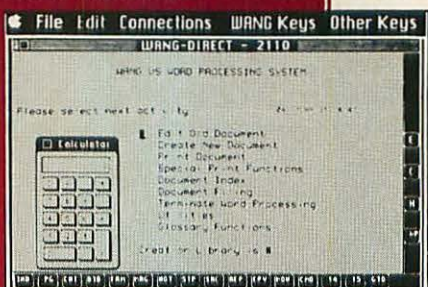
An additional key feature is direct transfer of Macintosh documents and files in and out of Wang Office.

All the standard features of VsCom/PC are included.

Make the Wang connection your way!

M/H GROUP

300 West Adams Street • Chicago, Illinois 60606
PHONE 312.443.1222 • FAX 312.443.1377



Paint in Claris boxes as well. Version 3.0 of PageMaker with its label proclaiming NEW. A hodgepodge of Apple II, PC, and Mac software. I overheard training going on upstairs and questions being asked that made me want to go up and offer answers. I left in a hurry. The day was getting old.

Elsewhere in town I found the Computer Selection Business Center, an Apple authorized dealer. I asked if they sold PCs and was told that the store sold only Macs. The software selection was better than that of the Computer Factory, but still a little sparse. They had Datacopy's OCR software, which would have helped the fellow at Egghead. Business Class from Mediagenic was still on the shelf, even though it was withdrawn from the market last year. There was no PageMaker on the shelf—I hoped this was a sign that they, too, were awaiting the new version.

The store had kiosks divided up into work areas: networking, engineering, page makeup, business. Most of the work areas were empty, with no equipment available to match the labels. The two salesmen were bantering and, after trying to help me, went off to a kiosk to play MacGolf. I took that as a good sign. There was a training room for DTP, and a product demonstration was in progress. I and the trainee were the only customers during my visit. I had the feeling that I could find help here, but that resources beyond major products and CPUs were limited.

Next I was off to ComputerCraft, the chain store where in 1984 I had surrendered a check for \$4000, all of my savings, to buy a PC so that I could finish a novel. I made one of the largest purchases of my life in 20 minutes. The store salespeople there were quick, fast, efficient. This ComputerCraft was big-time. Really business oriented. Three little island-kiosks displayed the different families of computers that were sold—NEC and other clones, Compaq, Next, and Apple. They had an SE/30 with an 80MB hard disk for \$4749, a IIfx with 4MB of RAM and one floppy drive for \$8969. A IICI with 4MB of RAM and a 160MB hard disk went for \$10,969. Basically, the store had Claris and Mi-

(continues)

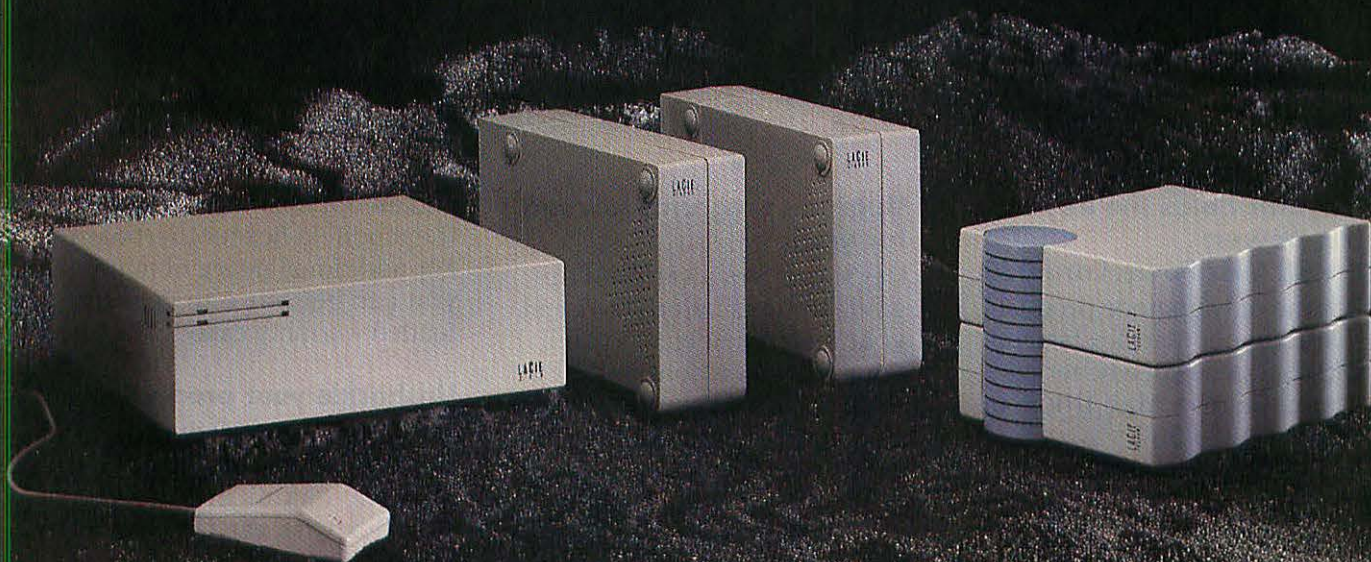
Circle 160 on reader service card.

IT'S ALL HERE IN BLACK AND WHITE

Up to now Macintosh users had only one choice for hard disk solutions. One choice for warranty. One choice for service. One choice for hard drive mechanisms. And one choice for cases.

La Cie expands your choice. La Cie offers you national onsite service up to one year, warranty programs from one to five years, toll free technical support, optional carrying case, your absolute choice of Connor, Hewlett-Packard or Quantum drive mechanisms, and three different case designs to choose from — ZFP, Cirrus and Tsunami. Of course, Silverlining is included too.

Since 1985 La Cie has offered you more. It's your choice.



Drive Mfg.	Size MB	Seek Time (ms)	ZFP Price	Cirrus Price	Tsunami Price	Warranty Year(s)
Conner	20	25	399	499	599	2
	40	25	479	529	699	2
	40	15	529	579	799	5
	50	15	599	659	899	5
	80	15	799	859	1099	5
Quantum	105	15	899	959	1199	5
	120	15	999	1059	1299	5
	170	15	1199	1259	1599	5
	210	15	1399	1459	1899	5
HP	660	15	3099			5

"La Cie gives hard disks a Silverlining."
MacWeek 1990

Call to order (800) 999-0143. International
or U.S. call (503) 691-0771. Fax: (503) 692-8289

See you at MacWorld

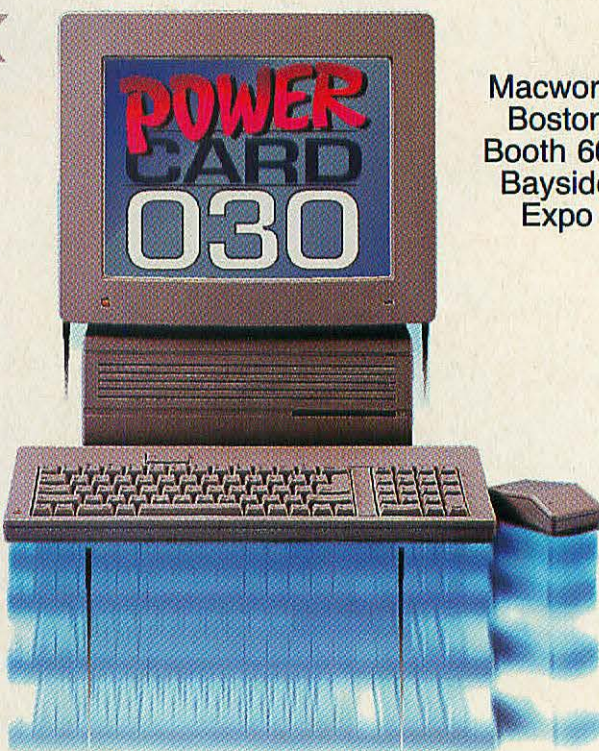
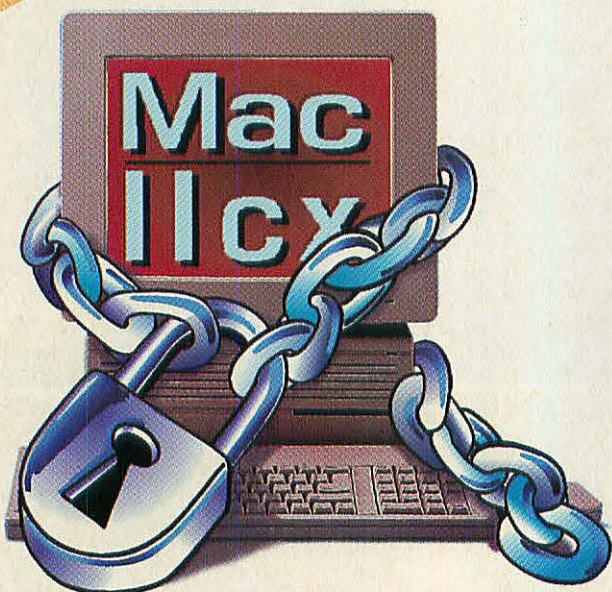
LaCie LTD.

Circle 199 on reader service card

Prices shown are cash prices and do not include shipping. Add 3% for Visa, Mastercard, 5% for American Express. Add 10% for rush handling. Silverlining, ZFP, Cirrus, Tsunami and La Cie are trademarks of La Cie, Ltd. Other names are trademarks of their companies. Prices and specifications are subject to change without notice. © Copyright 1990.

SET YOUR CX FREE...

GIVE IT MAC IIcx PERFORMANCE!

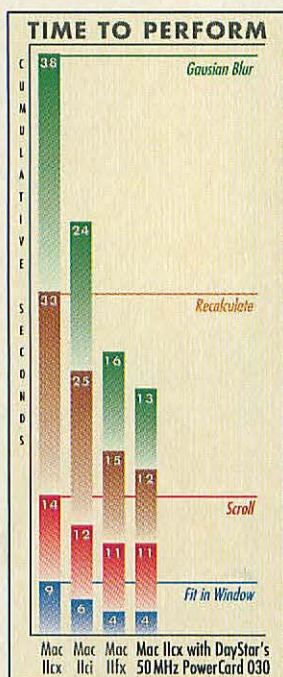


Macworld
Boston
Booth 601
Bayside
Expo

DayStar holds the key to IIcx power: the 50 MHz PowerCard 030.

It is the only upgrade product that lets your Mac IIcx take off with the same speedy performance as the Mac IIcx. The PowerCard 030 makes tasks like image blurs or recalcs even faster than the IIcx. You are free to do better work in shorter periods of time.

And you have choices: the PowerCard 030 is available in 25, 33, 40, and 50 MHz versions. You choose the performance you need at a price you can afford.



Upgrade programs tailored for you.

DayStar offers a series of upgrade options tailored to meet your specific needs. Even if your IIcx has a soldered CPU, we can still upgrade it in a matter of minutes—with little or no down-time.

30 Days or Your Money Back.

DayStar backs all its products with a 30 day money back guarantee through participating dealers. We offer a one year warranty on the PowerCard 030

and an optional warranty on the modified IIcx motherboard. For additional peace of mind, you can get our one year extended warranty called *StarCare*.

Unshackle your productivity.

So don't be shackled; turn the key and set your Mac free. Unlock the chains around your Mac IIcx with the DayStar 50 MHz PowerCard 030.

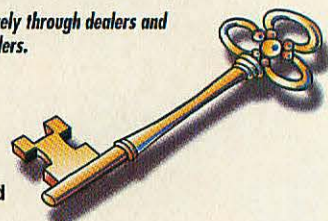
There's a dealer near you. Call today.
1-800-962-2077 Ext. 711

Making Business More Productive

DAYSTAR
DIGITAL

Available exclusively through dealers and value added resellers.

Dealers circle 404 on reader service card
End users circle 477 on reader service card



For
MACWORLD
Subscribers
Only

POWER UP

And Save 49%

YES!

Please send me a year (12 issues) of MACWORLD for only \$24.
That's almost 50% off the annual cover price of \$47.40.

NAME _____

COMPANY _____

ADDRESS _____

CITY / STATE / ZIP _____

☐

Please bill me.

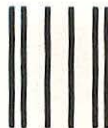
☐

Payment enclosed.

Allow 4 to 6 weeks for delivery. Basic subscription price is \$30 for 12 issues. The annual cover price is \$3.95 per issue, \$47.40 annually. Add \$18.00 per year for Canadian and Mexican subscriptions.

4AS85

**Subscribe today
and SAVE \$23.40!**



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

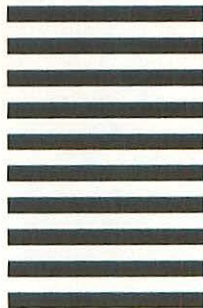
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

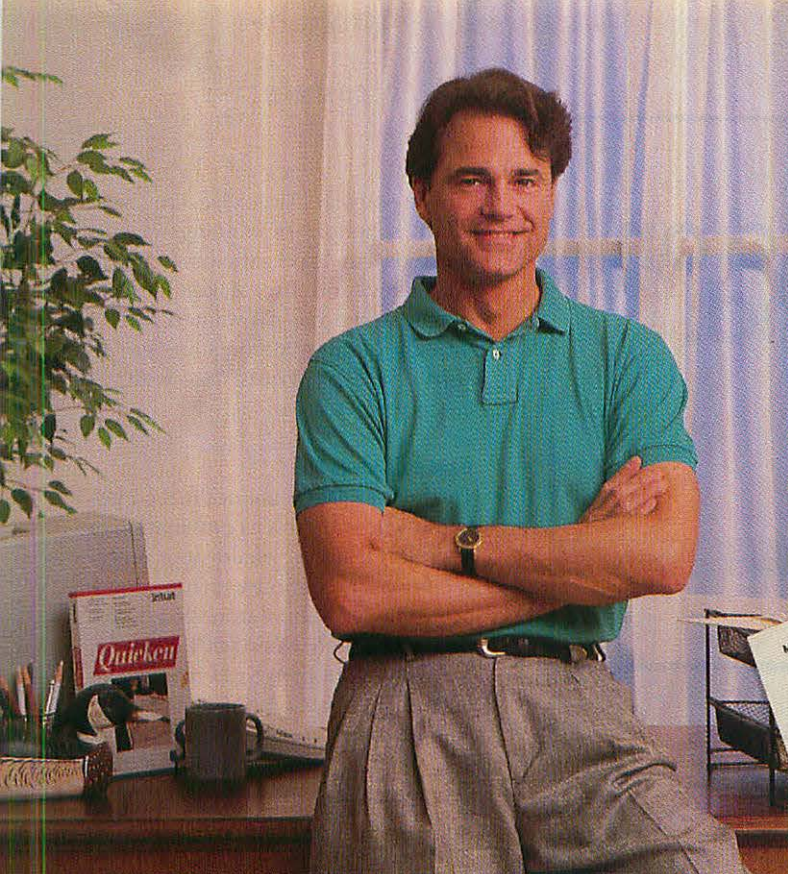
Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666



Detach and mail today!

**Don't
let this
card get
away...**





"If you have to worry about money, you might as well be poor."



"Quicken's reports tell me where my money goes and how much I have. Now I'm in control."

"I was making more money. But I wasn't worrying any less. Until I invested \$59.95 in a copy of Quicken.

Now I always know exactly where my money went. Exactly how much I have. And exactly what I can afford. I never wake up wondering if a big purchase was a big mistake.

The uncertainty is gone. I've never felt so organized about money.

I'm in control now.

Where did my money go? As I pay my bills, Quicken automatically notes each type of expense — utilities, clothing, charity, whatever. Then a simple click gives me a report showing how much I spent in every expense category each month.

How am I doing? Another click shows my budget vs. actual. Credit application? In seconds I've got a financial statement showing income, expenses, and net worth. Tax time? No sweat. Quicken provides one report with all my itemized deductions.

It's fast.

Time to pay bills? Quicken has "memorized" all my regular payments. I just confirm the amounts and Quicken prints out checks for me to sign. I still use my regular checkbook when it's more convenient. Either way, Quicken instantly keeps my accounts balanced and organized.

It's easy.

Getting started is no problem. There is no set-up involved. No chart of accounts to create. No stacks of old records to enter. I was recording checks in 3 minutes. That simple. Someday I just might read the rest of the manual to see what else Quicken can do.



"Quicken's windows look just like my checkbook. There is nothing new to learn."

It's a powerful business tool.

Quicken can control your business finances, too. It produces P&L statements. Forecasts cash flow. Tracks A/R, A/P, payroll. Shows trends and more."



Suggested Retail Price
\$59.95

Try Quicken for 30 days at no risk.

Are you making more money and enjoying it less? Order Quicken now. You'll quickly see why it's the best selling financial software in the world. But if you're not satisfied for any reason, return it for a full refund. No questions asked.

"There are dozens of Macintosh programs on the market...but few are as elegant, comprehensive and eminently easy to use as Quicken." — William Harwood, UPI 4/11/89



"Quicken is the best Macintosh tool for helping users manage home budgets or cash flow and do tax record keeping" — Ken Landis, MacUser 10/31/89



Send in the Coupon, or call
1-800-624-8742
24 hours a day, 7 days a week
U.S. and Canada

SPECIFICATIONS

All Macs with 512K RAM. Works with all monitors and printers, including laser printers. Unlimited FREE technical support. Not copy-protected.

☐ **Yes**, I'm ready to take control of my finances. Send me the Macintosh version of Quicken for only \$59.95. If I'm not completely satisfied, I can return it within 30 days for a full refund. Free shipping by air within the U.S. CA residents add sales tax. For coupon orders, allow 10 working days for delivery in U.S., slightly longer in Canada. International shipping extra.

Name _____
Address _____
City _____ State _____ Zip _____
Daytime Phone (_____) _____
Preferred Payment Method (check one):
☐ Check enclosed (no purchase orders or C.O.D., please)
☐ VISA ☐ MasterCard ☐ American Express
Card No. _____ Exp. Date _____
Signature X _____

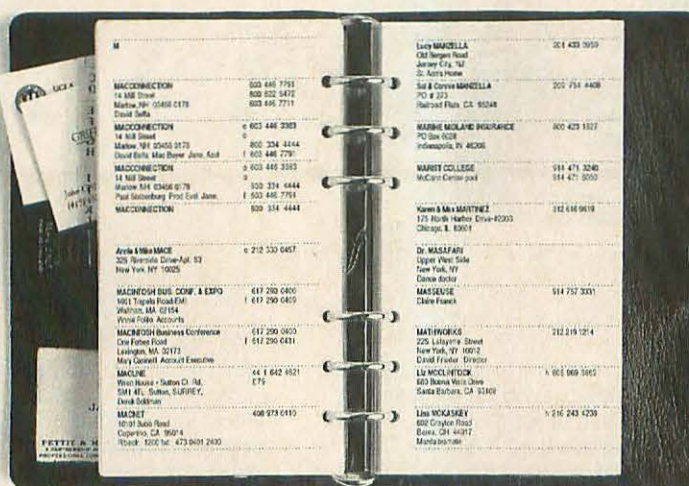
Mail to:
Intuit
P.O. Box 3014
Menlo Park, CA 94026

Or call:
1-800-624-8742
Canada and U.S.

► MW09P

You are stranded on a desert island.

(Choose one.)



If you'd rather forget your driver's license than your Day Runner,® meet Dynodex.™

Dynodex doesn't replace your organizer — it enhances it. Dynodex manages your names then prints them directly onto standard organizer-size paper (included). Just insert and go.

Print out special lists like, "All Prospective Clients in California."

Or, "Everyone except the ones I can't imagine ever calling again."

And remember, if, heaven forbid, you should ever misplace your organizer, your master list will still be in your Mac.

If you're convinced that your organizer and Mac should meet at last, call (800) SAY-DYNO for a personal introduction.

Because you gotta go...now.

DYNODEX

A few more reasons to move over to Dynodex 2.0:

Dial any number directly from the Dynodex desk accessory without leaving your work.

Print single- or double-sided pages.

Print out labels, envelopes, and Rolodex® cards.

Import names from any text file. Dynodex even comes with a special stack to retrieve Focal Point® or HyperCard® Address names. There's no need to reenter your info.

Export names to any application. Use Dynodex as a mailing list with form letters.

Dynodex is compatible with nearly all personal organizers, including Filofax®, Day Runner, and Day-Timer.®

All registered owners receive \$25 off selected Filofax products.

Dynodex is a trademark of Portfolio Systems, Inc. 158 Flushing Avenue Brooklyn, NY 11205

All other products are registered trademarks of their respective manufacturers.

COMING SOON: DynoPage™ (available separately) prints any Macintosh file to personal organizer pages. Carry-to-do lists, spreadsheets, expense reports, or sales plans with you at all times.

crosoft software. Little else. On a wall was a schedule of training: classes every day in Excel, Microsoft Word, FileMaker, and PageMaker. Several people asked me if I wanted help. I thought of Steve Martin's line in *The Man with Two Brains*, "So clean, so fast, so professional."

What's a Body to Do?

The answer, if you are not in a corporation where there's a combination of attention from the chain-store representatives and in-house technical support staff, is to find a store or a dealer that will be there when you need help.

We now have in San Francisco an outpost of the ComputerWare company. A little-promoted collection of stores that sprung from the first ComputerWare on California Street in Palo Alto, California. The Palo Alto store was a place of legend, where on a Saturday morning people like Jean-Louis Gassée would walk in carrying a cappuccino from the coffee shop next door, wanting to talk about the latest new product on the shelf. It was also the only place in the country back in 1985 that sold only Macintosh software. The salespeople were all Mac freaks and could explain why you were likely to be experiencing problems with some product.

ComputerWare has since become a chain of five stores. They still sell only Macintosh software—and they're still the most knowledgeable commercial outlet for Mac software in this area. Software is divided into labeled categories. PageMaker 4.0 was on the shelf, as was Finale 2.0. WriteNow 2.2 was there at a price of \$135. Adobe Photoshop sold for \$595, slightly over Egghead's \$575 price but still under Adobe's list price of \$895. They have lots of hardware but because Apple won't authorize the chain as a dealer they can't sell Macs. (You figure it out. Better yet, visit an authorized store and ask questions about software.) All of the Adobe PostScript Type Library lined one set of shelves. There were scanners, printers, CD ROM drives, hard disk drives. After five years it's not the Saturday morning place for a coffee, but if I were buying software that's where I would go.

The last store of the day was an
(continues)

Circle 198 on reader service card.

Learn with Personal Training Systems, and make your applications soar!



Learn how to unleash the power of your software using our interactive, self-paced audio tutorials.

Just like a private tutor at your side, the instructors on our audio tape talk you through your software, step by step. With your hands on the keyboard, trying each new skill as it's introduced, learning is a snap. And these tutorials can be used anytime, anywhere. Since the tutorials can be used over and over again, just one set can train your entire staff.

And we offer different levels of

tutorials — from Beginning to Advanced — so there's sure to be one at the right level for each staff member. Our hands-on tutorials are available for:

- Macintosh Basics ■ Excel 2.2
- Word 4.0 ■ PageMaker 4.0
- HyperCard 2.0 ■ Illustrator
- FileMaker Pro ■ FreeHand 2.0
- Persuasion 2.0 ■ Works 2.0

So if you're looking for a fast, convenient and affordable way to master Macintosh software, call us and we'll send you a color catalog containing complete details.

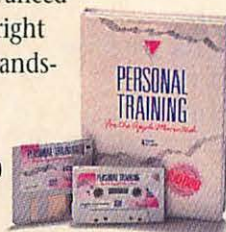
**PERSONAL
TRAINING
SYSTEMS**

Just like having a private tutor!

CALL 1-800-TEACH-99

(408) 559-8635 FAX (408) 977-1166

Use the same training Apple uses for its own employees, and sells under its own name internationally!



To receive a free color catalog, mail to: **Personal Training Systems**, 828 S. Bascom Ave., Suite 100, San Jose, CA 95128 U.S.A.

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

OF MACS _____

MW 9/90

The following are registered and unregistered trademarks of the following companies: Apple, Macintosh, HyperCard — Apple Computer, Inc.; Claris, FileMaker, FileMaker Pro — Claris Corporation; Adobe, Adobe Illustrator 88 — Adobe Systems Inc.; Aldus, Persuasion, PageMaker, Aldus FreeHand — Aldus Corporation; Microsoft, Excel, Microsoft Word, Microsoft Works — Microsoft Corporation; Personal Training, Personal Training Systems — Personal Training Systems, Inc.

© 1990 Personal Training Systems. All rights reserved.

Circle 37 on reader service card



Hand Tools.

You know what it's like. If you're in graphic arts, you know there's a lot of grunt-work.

Like rubbing-down type. And tracing and filling letters to comp-up headlines.

Trying to get true colors from a junkyard of dried-out markers.

Inking and re-inking rules and borders because of clogged pens.

T-squaring elements to be sure they're aligned and square.

Counting characters.

Spinning proportion wheels.

Tracing off the Lucy.

Wouldn't it be nice to spend more time exercising your brain instead of

your wrist? Exploring concepts? Refining layouts? Trying "What if" design options? Or experimenting with color combinations?

That's exactly what you can do using today's advanced layout, design, and illustration programs, the Macintosh II™ family of computers and a CalComp DrawingCard™ display system.

CalComp large screen displays help you get the most from your Macintosh. For one thing, they never let you lose sight of the big picture. DrawingCard is the first 21" system to give you two full pages of color side-by-side at actual size. That's critical when you're

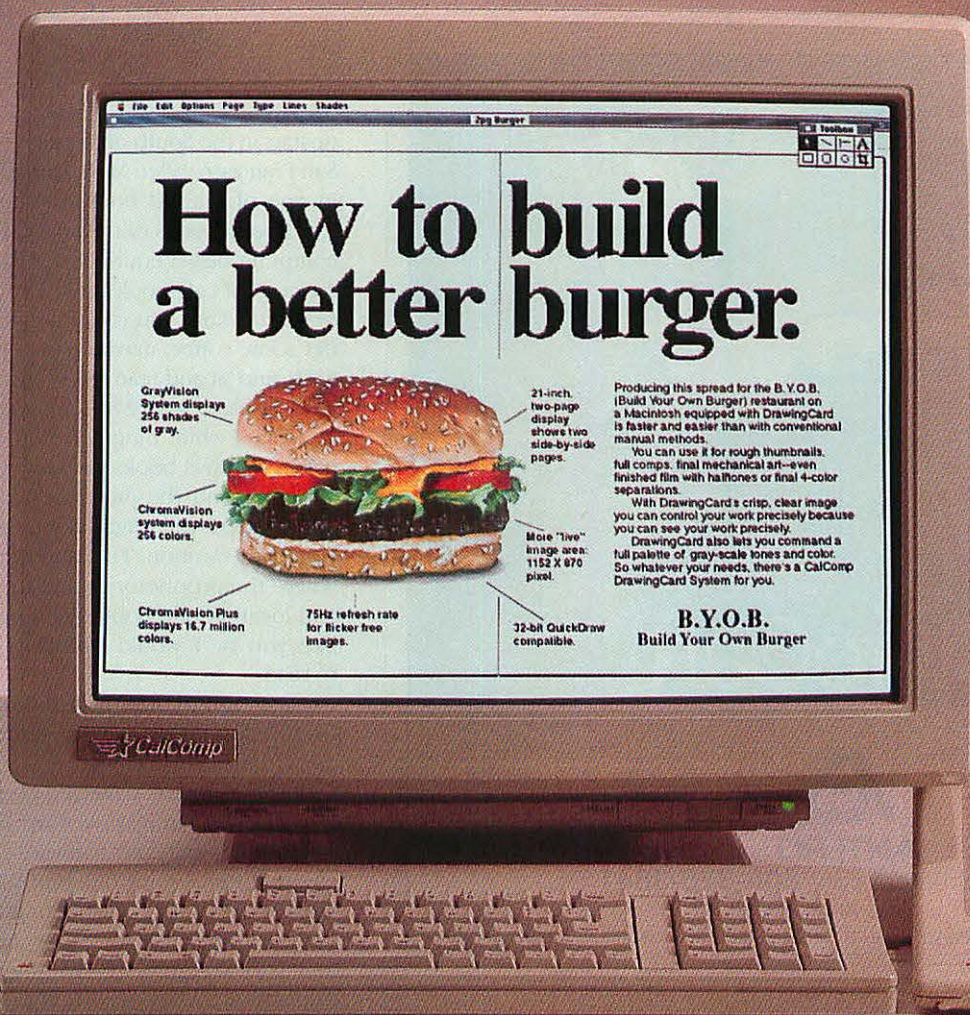
designing double-truck ads, brochure spreads or creating a large horizontal illustration.

DrawingCard's flat screen eliminates distortion and with its excellent resolution and contrast you can see the effect of small changes in the colors right on the screen. Or evaluate the visual effect of half-point variations in type size and leading. You can even see the precise amount of letter overlap when you set your headlines "tight and touching."

And with DrawingCard displays, what you see on the screen is what you get on your printer because screen resolution is true 72 dpi.

See Us at MacWorld Expo Boston, Booth #1022 Bayside

All screen images were scanned, imported, displayed and photographed on CalComp DrawingCard displays.
© 1990 CalComp Inc. DrawingCard and WIZ are trademarks of CalComp Inc. Macintosh is a trademark of Apple Computer, Inc.



21" ChromaVision Plus

Power Tools.

There are three DrawingCard systems to choose from. Our 8-bit GrayVision display system with 256 shades of gray is ideal for desktop publishing and design projects using line art and black-and-white halftones.

Our 8-bit ChromaVision system with 256 colors is the perfect match for the great majority of desktop pub-

lishing, design and illustration projects where 4-color reproduction is needed.

And our 24-bit ChromaVision Plus system (shown above) with 16.7 million colors is the ultimate display where color accuracy is especially critical such as color retouching.

DrawingCard display systems are just one way CalComp, a worldwide

graphics leader, supports the arts on Macintosh. There's also WIZ™, a new mouse system that combines the features of a traditional mouse with the power of a graphics pad. Plus a complete line of high-performance printers.

So stop using those antique hand tools today. After all, the graphic arts should be full of inspiration, not perspiration. For more information about DrawingCard displays, call:

1-800-CalComp.

In Canada, call: (416) 635-9010.

Circle 122 on reader service card

**We draw on
your imagination.™**



A Lockheed Company

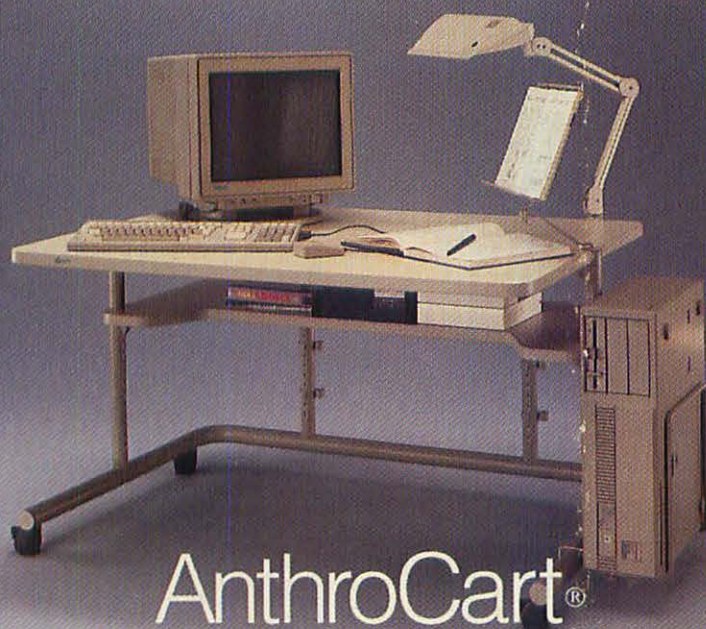
21" GrayVision



21" ChromaVision



DrawingCard monitors feature 75Hz refresh rate for flicker-free performance, large live area (1152x870 pixels) and 72dpi screen resolution for true WYSIWYG.



MOBILE ADJUSTABLE INCREDIBLY STRONG



Call for a free catalog: 800-325-3841

6:30 AM - 5:00 PM, PST

Anthro Co. • 3221 NW Yeon St., Portland, OR 97210 • (503) 241-7113 • FAX: (503) 241-1619

RETROSPECT

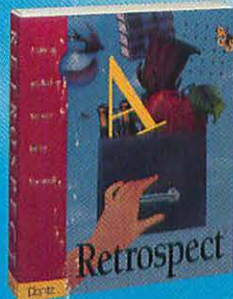
ARCHIVING & BACKUP SOFTWARE

1989 Eddy
Award for
"BEST BACKUP
SOFTWARE"
by MacUser
Magazine.

To Go Forward You Must Backup

On the Macintosh, creation and storage go hand-in-hand. You create. Then you store. Pretty soon, your hard disk is full of files--each one vulnerable to a hard disk crash. Retrospect will protect your creativity. And offers more than any other backup software: Archiving. Archive files to keep your storage needs in check. Retrospect supports almost any storage device and has compression, encryption, and full file selection. Run it automatically with a built-in calendar.

**Retrospect. The Best Backup
for Your Creativity.**



Dantz
Development Corp.

CALL OR FAX

CALL: (415) 849-0293 FAX: (415) 849-1708

Circle 259 on reader service card.

upstart in the South of Market area of San Francisco called Macadam. There, in one of the old brick warehouses that line the sides of the street, is the computer-dealer equivalent of the old concept of cafe-bookstore. The kind of place where you could go and order some coffee, maybe even a sandwich, and sit and read the books. The kind of place where steaming coffee in a thick white mug and rich color plates in travel books beckon you to sit and spend the morning thinking about where you might like to go for your next vacation. The kind of place where the proprietor knows the title and location of a book that a person like you or I would probably want to read.

Tom Santos, four colleagues, and his two dogs preside over just such an emporium, stocked with the Macintoshes that he has collected over the last six years. Little alcoves are set up with equipment and software. Each alcove features some different subject area: music, DTP, engineering. Real people come into the store and sit and work at computers that they cannot afford to buy. There is a lot of current software on the shelves in the center of the store. Copies of back issues of Macintosh magazines line the walls. I carried a soft drink into the store and wandered around while waiting for Tom. The huge wooden rafters of the high ceiling and the industrial carpet give the place a quiet, slightly worn feeling. Printers from various manufacturers hum away in odd corners. Designer cases for Macs and hard drives sit on shelves. It's the sort of place people come into on weekends to argue the merits of the latest version of popular software.

So?

The truth of the matter is that there are many good stores out there, but few people know how to find them, or have the time, or are patient enough to wade through all the bad stores to find a good one.

And so mail-order purchase, at least for software, thrives. Just as it did in the PC marketplace. And most people will never have the joy of sitting down with a coffee and Tom Santos as he waxes technical over the latest version of some product. **M**

How Does Our High Density Drive Stack Up Against Apple's?



Drive Manufacturer	APPLE	AE
FDHD (read/write MS-DOS, ProDOS)	yes	yes
Sony mechanism	yes	yes
Manual and auto eject	yes	yes
FCC certified design	yes	yes
Apple-standard footprint	yes	yes
ABS plastic case	yes	yes
Apple-standard platinum color	yes	yes
2-color read/write indicator	no	yes
Full daisy-chain compatibility	yes	yes
Custom molded DB-19 cable	yes	yes
800K capacity	yes	yes
1.44 MEG SuperDrive capacity	yes	yes
One year warranty	yes	yes
Worldwide dealer sales & support (over 2,000)	yes	yes
800K MSRP	\$429	\$289
SuperDrive MSRP	\$629	\$339

Everyone wants a second SuperDrive, but not everyone wants to pay the hefty price. Now there's an alternative. Applied Engineering's new 3.5" high density drive looks, feels, runs, reads, writes just like Apple's. It even smells like Apple's. But it costs a lot less. And with our exclusive 2-color read/write indicator you can actually tell what your drive is doing at any given moment. We even make a Mac II external drive adapter (\$19), so you can add a second high density drive to your Mac II, IIx or IIcx. So how's our drive stack up against theirs? That's the bottom line.

Applied Engineering also makes a line of fax modems, memory cards, multi-function cards and other fine Macintosh peripherals. For ten years we've forged a reputation for exciting and innovative products, backed with the best

warranties and the best technical support in the business. Find out why.

Order today! To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 7 pm, 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 7 1/4% sales tax. Add \$10 outside U.S.A.

AE
Applied Engineering®
The enhancement experts.

A Division of AE Research Corporation

(214) 241-6060

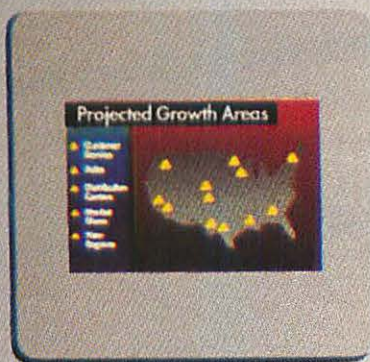
P.O. Box 5100
Carrollton, TX 75011

**Made
IN THE
USA**

©1990 AE Research, Inc. All rights reserved. Prices subject to change without notice. Brand and product names are registered trademarks of their respective holders.

Circle 51 on reader service card

HAVE YOU WRITING ON



You can't judge a slide on a light table. To see how sharp it is, you've got to blow it up on the wall.

Which is what we've done here. You're looking at a real slide, created with a MATRIX® film recorder, and projected onto a 4'x 4' screen.

Look closely. And ask yourself: Do my slides look this good?

If not, then it's time to consider a MATRIX film recorder from Agfa.

To give you a sharper image, we use a seven-inch picture tube—the largest in the industry—along with up to 8,000 lines of resolution. Our color wheels are ground to military specifications, and carefully mounted to minimize distortions.

You'll find these details in every MATRIX film recorder, from the low-priced desktop



ProColor® to the new, professional Forte™. With Conductor™, our image management soft-

SEEN THE THE WALL?

ware, our film recorders support all major Macintosh and PC software packages.



Slide shows aren't the only thing you can create with a MATRIX film recorder. Our ChromaScript™ raster image processor lets you image true PostScript® art.

Which is something you just can't do with any other film recorder.

Find out why MATRIX film recorders have garnered top honors from

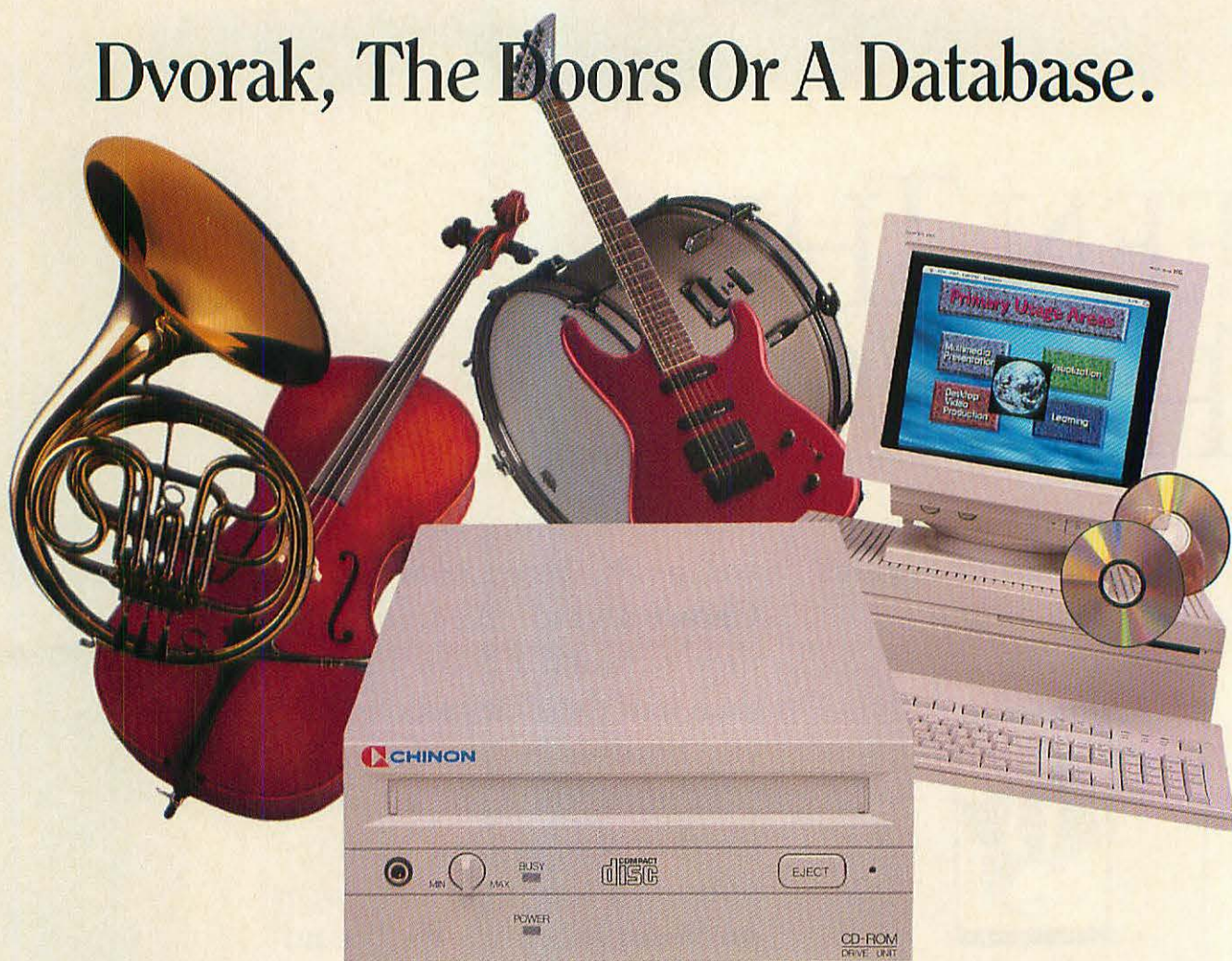
Publish! and *MacWorld*, as well as *PC Magazine's* Editor's Choice award. And why they've found a home in more than half the slide-making service bureaus in America.

Call 1-800-876-7543 now for the name of your local reseller and a copy of our *Focus on Slides* brochure. We'll send a sample MATRIX slide, too. One you can put on your own wall, and judge for yourself.



Circle 234 on reader service card

Dvorak, The Doors Or A Database.



Chinon's New CD-ROM/Audio Drive Handles Them All Beautifully.

CD's can hold a lot of data in an easy to handle, durable form. They're useful for much more than music. Each CD holds about 600 megabytes of data. That's roughly 250,000 pages of text! With quick and easy access that makes it a snap for you to find what you're looking for, whether your favorite passage of music or information from a large database.

Chinon's new CDA-431 is at the forefront of this new technology. This drive offers one of the fastest access rates anywhere — 350 milliseconds — at a price you will find surprisingly affordable. Use it with your Mac to access huge amounts of information quickly — or hook it up to your audio system to play any kind of music on CD. Chinon's CD Audio-Play software makes it all easy.

Every day there's more software published on CD — reference works, databases, graphics libraries and more — all in a convenient, easy-to-use format that can take a lot of heavy use. The CDA-431 reads any disc written in the "High Sierra" or HFS standard formats, giving you access to a vast library.

Experience the CDA-431 for yourself. Call TOLL-FREE for the dealer nearest you, or for more information. Whether for work or play, data or audio, it'll be music to your ears.

CHINON

Chinon America, Inc., 660 Maple Avenue, Torrance, CA 90503

Toll-free (800) 441-0222 In Calif. (213) 533-0274

See Us at Macworld Expo Booth #425

Circle 8 on reader service card



LETTERS

The End of Literacy

I agree completely with your fears of where multimedia will take us [*The Iconoclast*, June 1990].

It appears that the end of literacy is indeed upon us. I had some hope that video-text communication would force a higher level of literacy, since people will be communicating by written word to a greater extent. However, this basic literacy is not the same as that required to appreciate good literature.

It reminds me of the statement in Victor Hugo's *Notre Dame de Paris* that books will kill architecture. In the Dark Ages, frescoes and murals in cathedrals were used to communicate about life. The invention of the printing press spelled doom for architecture as it was known.

Well, multimedia will most likely destroy literature and our ability to appreciate it. I had previously regarded personal computers as entirely beneficial. Thank you for exposing this dark side.

Kevin Garrett
via America Online

The Value of Visual Media

As a longtime reader of *Macworld* and your columns, I'm amazed and challenged by Steven Levy's column on multimedia. While your column raised many legitimate and troubling issues, it also unfairly slighted a promising new commu-

nication medium.

Yes, I readily admit that most of what will result from multimedia technology will be junk. But if I, as a developer of interactive video and educational programs, must accept responsibility for MTV's Robert Pittman, then will you (as print's champion) accept responsibility for Rupert Murdoch, the *National Enquirer*, and *People* magazine? Why should I have to answer for all the meaningless uses of multimedia technology, any more than you should have to answer for all the trivial and mind-numbing uses of print?

I agree entirely that Apple's helocar campaign portrayed multimedia technology at its worst. But if multimedia gives powerful tools to bozos like the two

guys in the helocar commercial, the same tools give educators powerful new ways to present real information, including complex audiovisual information like the medical diagnostic images my multimedia work deals with. Perhaps you've been talking to too many marketing people and just haven't seen enough real folks applying multimedia to real, nontrivial problems.

I detect in your thesis a strong antivisual prejudice, one that I see all too frequently since I became an artist. Computer and multimedia technology may yet help to redress a serious imbalance in our communication media in favor of text alone. Look at Edward Tufte's book *Envisioning Information* (Graphics Press, Cheshire, Connecti-

cut, 1990) for an eloquent explanation of the power of visual communications.

You must expect our first steps into multimedia to be halting and uncertain. It is also true that most of the attention will be on the dog-and-pony shows put on by Marc Canter and his ilk in order to sell more copies of MacroMind Director. We don't expect to see great literature from the authors of Microsoft Word; why set up Canter as the last word on the direction of multimedia?

Patrick J. Lynch
Yale University
New Haven, Connecticut
(continues)

Corrections

The retail price for the gray-scale version of *Drawing-Card Display Systems* (New Products, July 1990) is \$3195, the 8-bit color version is \$6395, and the 24-bit color version is \$8595.

Intusoft's *IsSpice for Macintosh* (New Products, June 1990) is by Intusoft, not Intuit.

The NoRad radiation/glare shield can be grounded to the anchoring screw of a Mac's D-connector whether or not the port is in use (Letters, June 1990).

The Playroom, educational software for preschoolers by Broderbund Software, retails for \$49.95 (Reviews, July 1990).
(continues)





Months on chart	Last month	This month	HARD DISKS*
6	2	1	MacStack SD40 CMS Enhancements
8	3	2	Apple Hard Disk 40SC Apple Computer
34	1	3	Apple Hard Disk 20SC Apple Computer
1	—	4	Platinum PI 40 External CMS Enhancements
9	—	5	MacStack SD30 CMS Enhancements

This is how the hard disk category should have read in August's Best-Sellers.

TV Is Not the Culprit

Most of Steven Levy's complaints about the intellectual inadequacies of the TV generation have an element of truth. But he points the finger at TV as the culprit, when in fact the culprit is the education system in this country. The real reason most people can't reason well or think critically is that the schools fail

to teach these skills. The simple act of watching TV does not destroy the ability to think clearly. Video does not stifle rational thought simply because it combines pictures with sound, as Levy claims.

Steven Levy has fallen into the intellectual trap of believing that written language is the only acceptable medium for rational dis-

course. What he forgets is that great minds somehow have managed to express their thoughts in other media—for thousands of years. Written language is not the sole medium of the human intellect. Is Shakespeare, who worked in the multimedia idiom of the theater, less worthy than Dickens, who wrote monomedia novels? Did Stravinsky and Balanchine miss the boat by expressing themselves through collaborations in music and choreography instead of the written word? Would Levy prefer to read a novel by Stravinsky or perhaps a corporate annual report by Balanchine?

True enough, the bulk of TV programming is guilty of the crimes Levy describes—but so are all other

media, including the written word. The problem is not which medium we use but how we use any particular medium or combination of them. If Levy wants to stop the growing trend toward shallow, superficial thinking in our society, he should support the teaching of the vocabulary, grammar, and syntax of as many media as possible, from the written word to music, dance, architecture, graphic arts, and (gasp) even video. By denying that responsibility and wishing that other media didn't exist, we will perpetuate the problem, not cure it.

I love the written word, but I recognize that it is only one of the many acceptable media through which human beings com-
(continues)

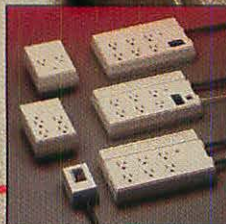
HIGH POWERED MANAGEMENT

Here is high level protection for high powered operators. The Elite line of surge protectors from ACCO®. Pico-second response. Ultra high energy dissipation. Plus, a 24-hour express warranty service. If you're into power, plug into Elite.



ACCO

MAKING YOUR WORK PLACE A BETTER PLACE TO WORK.



The Elite line-up

© 1990 ACCO Swingline

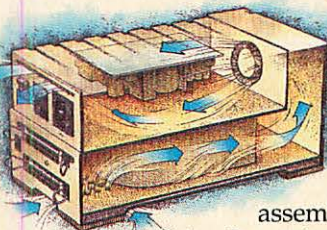
Circle 315 on reader service card.

How The New Kid On The Block Made The Best Drive In The Business

The Protégé from MacAvenue is everything you'd expect from the best drive in the business: quiet, cool, quick, elegantly engineered, tough enough to travel, and priced to move. But the single most important feature of this handsome little box has more to do with its ancestry than with its aggressive price.

The Protégé hard drive features an out-standing pedigree. That's because the parent company of MacAvenue is CompuAdd, a computer industry leader in value, performance, service and support. CompuAdd's high quality and low prices have made it one of *INC. Magazine's* fastest-growing companies for three years running. So even though MacAvenue is a new kid on the block, we showed up with the smarts—and the resources—to build you the best drive in the business. And sell it to you for the best price on the market.

Here's how the Protégé will turn you on:



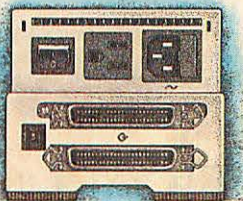
It's Really Cool

A drive that keeps its cool also keeps its reliability. The Protégé is a really cool machine because it maximizes air flow across its drive

assembly and its isolated power supply—efficiently cutting the danger of heat-related failure from the two most important parts of your drive.

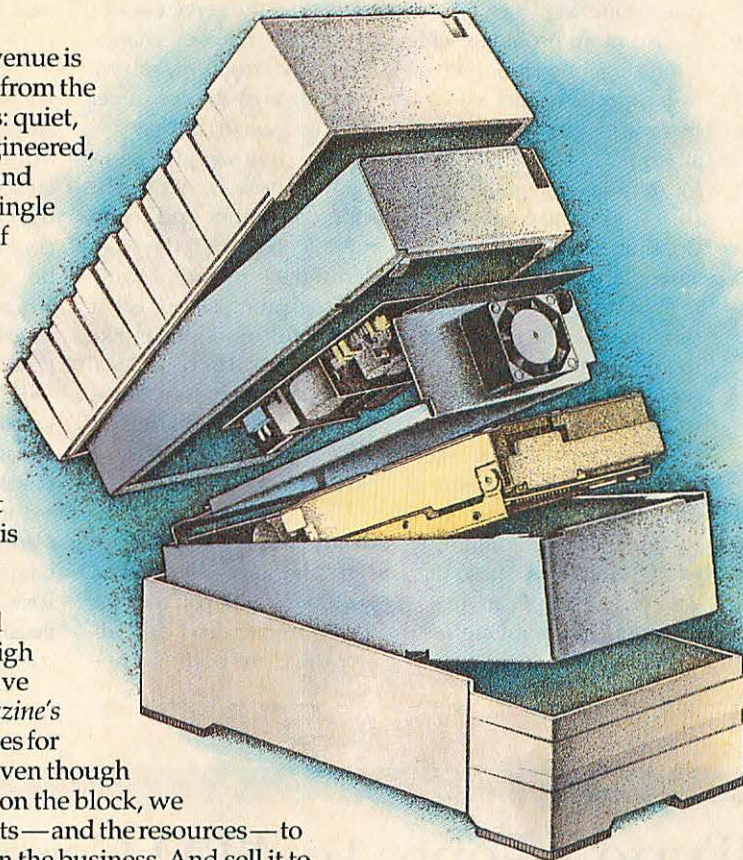
Attention to Details

Even the back of the Protégé is loaded with smart features. Like an extra power outlet for other drives or peripherals. A push-button SCSI ID setting. And an external terminator for convenience.



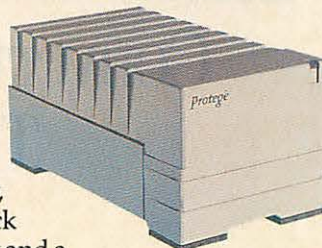
Loaded with Smart Software

Your Protégé will arrive pre-formatted and ready for work, loaded with easy-to-use, custom-designed utilities. The Protégé's Disk Management Software allows you to partition for more efficient drive operation and password protect each partition. The software even allows for disk spanning and creation of ProDOS and UNIX partitions.



Exclusive!

You'll Never Lose A File
Your MacAvenue Protégé is the only drive on the market to come bundled with On Location, the amazing file-finding utility that will search your entire hard disk and find a lost file in seconds. Just type in a file name or even a few words within the file. On Location does the rest. This utility was created by Mitch Kapor, developer of Lotus 1-2-3. **A \$129.95 value.**



Drive Your Bargain

Like all MacAvenue products, the Protégé is backed by superior documentation, a 30-day, no-questions-asked, money-back guarantee, a one-year warranty and a toll-free technical support line. So call now. And drive a bargain on the best drive in the business.

Protégé Hard Drives

Capacity	External		Internal	
	Seagate	Quantum	Seagate	Quantum
20+MB	\$345	n/a	\$295	n/a
40+MB	\$395	\$455	\$325	\$375
80+MB	\$525	\$645	\$465	\$595
100+MB	\$649	\$695	\$575	\$645

MacAvenue™

A Division of CompuAdd Corporation

12303 Technology Boulevard — Austin, Texas 78727

For more information call: **800-388-6221**

Key Code
9519

© 1990 by CompuAdd Corporation. CompuAdd and MacAvenue are trademarks of CompuAdd Corporation. Mac, Macintosh, HyperCard and Apple are registered trademarks of Apple Computer Inc. All other trademarks are the property of their respective companies. All return items must be accompanied by a return merchandise authorization (RMA) number. Prices and product descriptions are subject to change without notice. Neither CompuAdd nor MacAvenue is liable for damage due to omissions or typographical errors.



municate thoughts. In fact, many kinds of thoughts actually require other media for full expression. Commenting on people who insist they don't need to listen to a musical performance because they can "hear" it in their minds by reading the sheet music, the English composer Ralph Vaughan Williams asked what the effect on Ulysses would have been if, instead of singing to him, the Sirens had simply handed him a copy of the score.

Steven T. Birchall
Merrimack, New Hampshire

Online Monopoly

Wow! What a wonderful idea Steven Levy has in a monopoly online service [*The Iconoclast*, May 1990]. All we have to do is look at other monopoly services run

by corporations and the government to see what wonderful things we can look forward to with Levy's proposed OneNet:

No more problems with confusing innovation. Whatever interface gets chosen first will be *the* interface we'll all come to know and love for decades on end, or until the Consumer Interface Committee can come to an agreement on upgrades.

No more superquick signing up, which can lead to people getting too much service before they have time to stop and think about it. New customers can be asked to keep their computers idling and their modems set to autoanswer continuously from 8 a.m. to 5 p.m. so that the service rep can make the connection at OneNet's convenience.

Since OneNet will be a public utility, it will provide employment opportunities for lawyers and accountants every time the service wants to raise its rates or change its service structure, subject to approval by the consumer governing board.

Oh, and we just know the regulatory agency will be supercompetent and incorruptible, based on the wonderful track record of agencies regulating all our other wonderful monopolies like the U.S. Postal Service, local phone and utility companies, and the insurance cartel.

Scott32
via America Online

Liberty Drive Is a Winner

In "Midrange Hard Disks" (June 1990) you say the EMAC Impact and the Liberty drive are both fast and

lightweight but neither product has *anything* special to recommend it over La Cie's Cirrus, FWB's PocketHammer, or Maxcess's V-Series.

What about portability? The Liberty drive is less than half the size of any of the aforementioned drives. Its extremely small size has our customers frequently using the word *addicted*. How could such a strong feeling be engendered and yet *Macworld* not see the value? *Howard Winther*
President, Liberty Systems

We originally classed the Liberty as a good, but not great value. After considering the points you've raised and taking an informal survey of *Macworld* staffers, we've since decided it qualifies as a winner. It truly is noticeably smaller and lighter than the other drives.—Ed.
(continues)

Convert Type 3 Fonts to ATM Compatible Type 1 Fonts with EVOLUTION.™



Type 3 fonts with ATM™ before Evolution



Type 3 fonts with ATM™ after Evolution

At last, the text on your page and your display can be clear, smooth and legible at any size with any font — not just Adobe fonts. EVOLUTION™ is a utility that converts type 3 PostScript® fonts to Adobe® type 1 format and vice versa. The type 1 fonts that EVOLUTION produces are compatible with Adobe Type Manager™ (ATM). Type 1 fonts print clearer from a 300 DPI laser printer, they require less storage space and they process faster in the printer.

EVOLUTION also creates editable outlines from any PostScript font. Convert an entire character set to outlines, or just a headline.

The outlines can be further manipulated in either Adobe Illustrator® or Aldus FreeHand™. EVOLUTION does not require a PostScript® printer and costs only \$99. Available through your dealer or direct from Image Club. To order call 1 800 661 9410.



EVOLUTION™

Adapting to a changing environment.



Image Club Graphics Inc. Suite 5 1902 Eleventh Street SE Calgary Alberta Canada T2G 3G2 Phone (403) 262 8008 Fax (403) 261 7013 AppleLink CDA 0573
PostScript and Adobe Illustrator are registered trademarks & Adobe Type Manager and ATM are trademarks of Adobe Systems, Inc. Aldus FreeHand is a trademark of Aldus Corporation. ©1990 Image Club Graphics Inc.

E-MAGINATION AT WORK

MACHINES

ColorPage™ T16 all business display. Full page, full price: \$2995!*



When you've got the world's top rated Mac II display, all you can improve is the price! ColorPage T16 from E-Machines now offers Macintosh business professionals the best for even less — the ultimate combination of compact size and big-screen impact, just judged #1 again by MacUser LABS. You get a whopping 70% more working space than on a 13" Apple. Don't settle for less when now you can afford the productivity of a full page color display. Call 1-800-34-GRAPHIC for your nearest dealer. Or write E-Machines, 9305 SW Gemini Drive, Beaverton, OR 97005.



E-MACHINES
E-Magination at work™

If you live outside the U.S., call 503-646-6699 for the name of an E-Machines international distributor.
Copyright © 1990, E-Machines. Macintosh is a trademark of Apple Computer. *Suggested list price for a complete system.

Circle 101 on reader service card



DesignStudio's Greatest Strength

DesignStudio has the most powerful—and flexible—style sheets of any page-layout program. Because your reviewer ["Picking a Publishing Program," May 1990] hadn't figured out that a style sheet need not specify every attribute, he labeled as DesignStudio's greatest weakness what is possibly its greatest strength.

I seldom specify a type style in a style sheet so that I can change formatting, such as italics or boldfacing, without removing the style sheet, which answers the author's biggest gripe. Or I'll sometimes specify just one attribute—to turn off indents on opening paragraphs, for example, since one style sheet will override another without having to remove the first.

DesignStudio's style sheets are superior because you can apply them to single words instead of entire paragraphs. For instance, when I use Times I like to tighten up the bold but not the plain type. So I create a separate style sheet just for the bold—applying it is as simple as selecting bold to begin with—and once it's applied I can tighten or loosen all the bold type in the document through a single dialog box. Or you can create a style sheet that puts footnote numbers in a smaller size and shifts them up, all with a keystroke. And with the program's powerful search-and-replace function, you can even apply a style sheet to all the bold type in a document after the fact.

*Jon Marken
Hampden-Sydney, Virginia*

Maximum Exposure

I want to point out that this is a serious letter; I am not attempting to be amusing.

I have been using computers for several years now. After spending hours on end in front of computers, I began to notice that my nylon/rayon underwear would get holes in the crotch and eventually fall apart. It was almost as if they had been dipped in acid.

At first I did not associate this with my computer but assumed that the quality of underwear was deteriorating. A year or so after my underwear began to look like Swiss cheese, I mentioned it to my brother-in-law, a computer programmer. He said this was a common problem for men working a lot with computers. It had evidently happened to him and to his

associates.

I realize that people do not usually talk to others about the state of their underwear, but have you ever heard of this happening? If computers can do this to nylon/rayon underwear, what are they doing to the human body? I would be grateful for any information on this subject.

By the way, I haven't seen a single hole since I switched to cotton!

*Hal Bonillas
Anderson, California*

How about it, readers? Has anyone experienced a similar problem? This is the first we've heard of it.—Ed.

Invisible Upgrades

Over the last few months, your magazine has published many articles and an-
(continues)

WHAT DO YOU GET WHEN YOU CROSS A COMB BINDING SYSTEM WITH A 3-HOLE PUNCH?



RICHER. DocuBind™ does the work of two separate units—a professional comb-binding system and a 3-hole punch—at a fraction of the cost, so it won't squeeze your budget.

HAPPIER. DocuBind is easy to use. Binds documents up to 112 sheets in seconds. And its 3-hole punch handles up to 30 sheets with a push of the handle. It's heavy-duty, yet light-weight so you can carry it anywhere.

BETTER LOOKING. DocuBind creates professional looking, comb-bound documents that lie flat for easy reading. Makes your presentations look good, so you look good. Available wherever office supplies are sold or call (800) 776-3355.



DocuBind™
By VeloBind®

The Only Binding System That Packs a 3-Hole Punch.
Circle 27 on reader service card.

We didn't invent Desktop Publishing, We just made it *Easy*!

Publish It! *Easy* combines the sophistication of Publish It! with 10 Desktop Publishing firsts, and an innovative, new, easier-than-ever User Interface.

Now even newcomers to Desktop Publishing can produce powerful, Dynamic Documents everytime.

Everything is Included.

Publish It! *Easy* is an All-in-one Desktop Publishing program that lets you enhance the appearance of all your documents. Now you can put the emphasis where you want it, and bring words and graphics together to express your ideas like never before!

No Experience Necessary!

Using the Quick-Start Mini-Manual you'll create your first document in less than an hour.

Write a document, check the spelling, add as many graphics as you need, and print it out (on your Dot Matrix or Laser Printer), all in a few simple steps — all with one program — and get professional-looking results — everytime.

A Powerful Communications Tool for Everyone.

Whether you're a business owner or manager, a marketing specialist, secretary, or student, you'll get their attention with every announcement, letter and report you write.

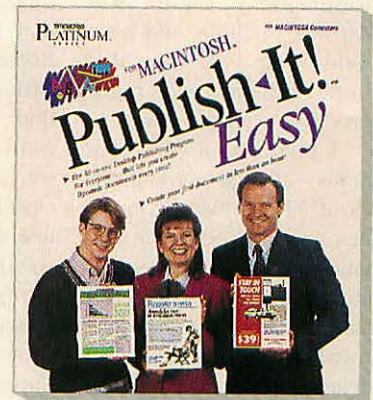
This Program Includes:

- A Fully Integrated Word Processor
- A 112,000-Word Spell Checker
- A 240,000-Word Thesaurus
- Advanced Page Layout
- Built-In Drawing & Painting Tools
- A Quick-Start Mini-Manual
- 72 Sample Page Layouts

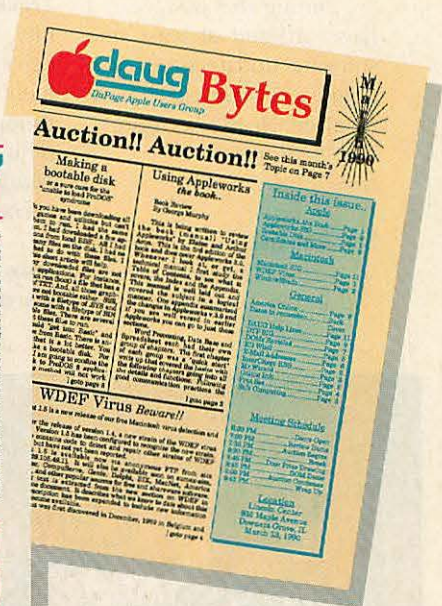
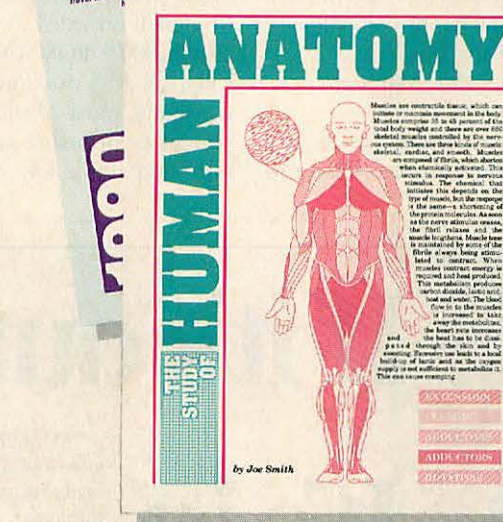
Technical Support

All Publish It! *Easy* registered owners get 60 days of technical telephone support absolutely **FREE!** Details inside every package.

©1990 Timeworks, Inc.
Macintosh is a Trademark of Apple Computer, Inc.
Circle 418 on reader service card



FOR MACINTOSH
COMPUTERS



LIMITED TIME OFFER!
Suggested Retail Price **\$199.95**
Special Introductory Price **\$99.95**
SAVE \$100.00

At your favorite dealer, or order direct
from Timeworks. **1-708-948-9202**

**TIMEWORKS
PLATINUM
SERIES**

What the reviewers say about Publish It! Version 1.1

"1989 Best Program of the Year"
InfoWorld

**"Publish It! provides more tools than
PageMaker and Ready, Set, Go!...it's
easier than QuarkXPress--and it's fast!"**
MacUser Magazine

Now Publish It! *Easy* brings the most used features of
Publish It! to anyone new to desktop publishing.

- ☐ **Yes! Send me Publish It! Easy**
I've enclosed \$99.95 + \$4.70*
(shpg. & handling). Total \$104.65
I get a full 60 day money back
guarantee when I order by mail.
Illinois residents add 6.5% sales tax.

☐ **Send me more information.**
Mail To: **TIMEWORKS**
444 Lake Cook Rd.
Deerfield, IL 60015-4919

*Prices apply to shipments within the Continental U.S.

Name _____
Address _____
City/State/ZIP _____
Card Number _____
Signature _____ Exp. Date _____
☐ Check, ☐ MC, ☐ Visa, ☐ Amex
1-708-948-9200 FAX 1-708-948-7626



nouncements about new software versions. And it's a good thing, too, since this is one of the few ways registered users get the news.

I own about 300 programs—all registered—from about 125 software companies, and I can count on one hand the number that regularly inform their registered users of upgrades. I've spent my whole career in sales, and I learned a long time ago that 60 percent of your sales come from installed base.

During the past year, I have ordered at least one software update from each upgrade document I have received. Need I say more?

Alan Applegate
Lakewood, Colorado

Star Trek Lives!

There is a clever message hidden on *Macworld's*

June cover, which indicates that Cathy Abes and Jerry Borrell are either brilliant Federation agents or unwitting dupes of Drew Huffman (or that Motorola has a great sense of humor). If you look closely at the chips in the illustration, you can see a not-so-subtle reference to the famed line of starships (made famous by the TV show "Star Trek") known as Enterprise—whose registry has always been NCC-1701.

Given the prevalence of Trekkies in the Mac community, I imagine you have received a number of comments like mine. I'm curious, though; was this intentional, or just a happy coincidence? Matthew C. Brush
Owings Mills, Maryland

It was no coincidence, but Huffman, who created the model, was not the

culprit. Eliot Smyrl of Pixar added that bit of Trek lore when he rendered the image.—Ed.

Praise for CompileIt


Thanks to Bruce Webster for the excellent look at Mac software development [*State of the Mac*, June 1990], which provided an insightful perspective of the programming environments as well as future trends. But I would like to have seen mention of Tom Pittman's CompileIt (Heizer Software), which can add power to HyperCard or SuperCard.

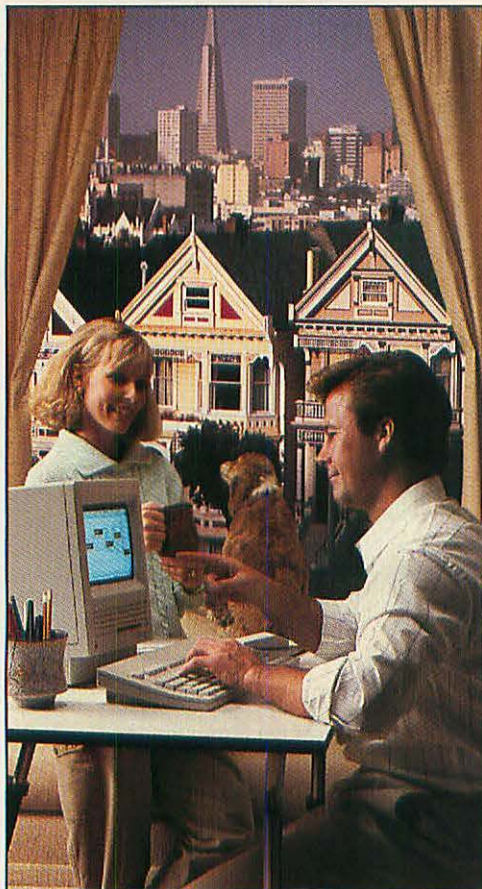
In addition to compiling HyperCard scripts into an often faster XCMD/XFCN, CompileIt provides access to all the 800+ ROM Toolbox calls, all the documented constants, most of the data structures in *Inside Macintosh*, and not a few of the

"Not in ROM" calls. It also knows about all the SuperCard callbacks.

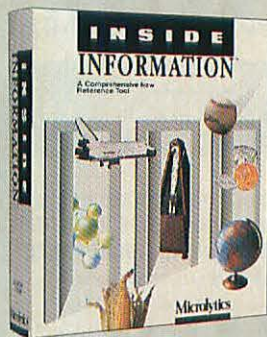
The manual provides enough information for the fairly competent HyperCard scriptwriter to compile scripts into successful externals, and familiarity with *Inside Macintosh* opens the door to accessing the Toolbox.

Brian Benison
Glendale, California

Letters should be mailed to *Letters*, *Macworld*, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702) or MCI Mail (294-8078). Include a return address. We regret that, due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. 



If it's out there, It's in here.



INSIDE INFORMATION is a new, invaluable reference tool which organizes the English language into logical categories. Far more than a dictionary or thesaurus, it lets you quickly and easily explore any of seven general Classes: *Nature, Science & Technology, Domestic Life, Institutions, Arts & Entertainment, Language, and The Human Condition*. These Classes contain 20 Subclasses, 125 Categories and 700 Subcategories. This new Macintosh DA is encyclopedic in size, offering over 65,000 terms with clear, succinct definitions.

You can choose from any of four information-viewing formats, including a unique Reverse Dictionary which lets you type a few words of description, and then displays the term you are looking for.

Business people, writers, and students will love INSIDE INFORMATION. It will enliven any letter, report, story, proposal, term paper, thesis or ad copy.

Microlytics

CALL 1-800-828-6293

IN NYS CALL 716-248-9150

Two Tobey Village Office Park, Pittsford, NY 14534

INSIDE INFORMATION is a trademark of MICROLYTICS, INC. WORD MENU is a trademark of Stephen Glazier. INSIDE INFORMATION is based on WORD MENU™ by Stephen Glazier. WORD MENU Copyright © 1989, 1990, Stephen Glazier. All rights reserved worldwide. DA by Millennium Computer Corp. Apple and Macintosh are registered trademarks of Apple Computer, Inc.

Circle 57 on reader service card.

Pocket Power

The world's first 3.5 inch, Erasable Optical Drive.

Pinnacle Micro, the leader in 5.25 inch optical storage systems now brings you the first 3.5 inch erasable optical drive.

The new REO-130™ with its small size and quick 28 msec. speed is what the world's been waiting for in optical storage.

Each 3.5 inch disk holds 128 megabytes of valuable data, safe and secure.

You can hold the disk in the palm of your hand. You can put it in your pocket, or drop it in the mail.

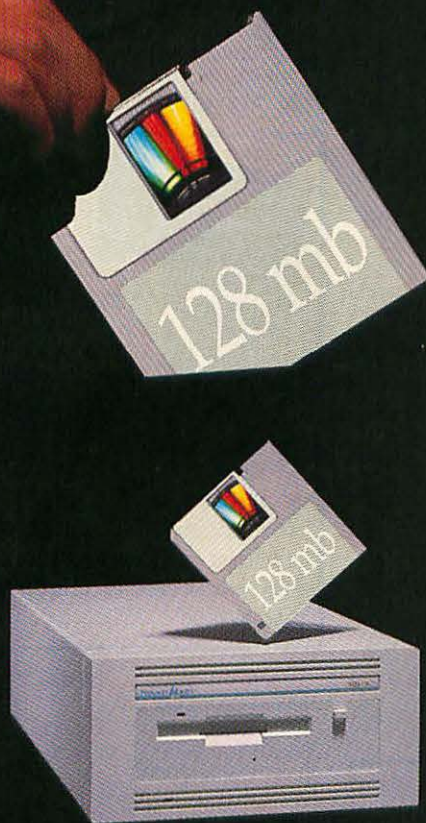
If you need to distribute or archive large amounts of data, the REO-130™ is the perfect choice.

The drive system is available in both internal or external versions. Interface kits available for MAC, SUN, DEC, IBM and compatibles.

Pocket sized. Amazingly fast. Large capacity, is optical storage now.

Another first from Pinnacle Micro, the Optical Storage leader.

Call today for the name of your nearest authorized dealer.



The world's fastest 3.5 inch,
Erasable Optical Drive.

☎ (800) 553-7070


PINNACLE MICRO

THE OPTICAL STORAGE COMPANY™


We're starting to

The majority of products we carry are covered by 30-60 day Money Back Guarantees (as listed here in red). If you're not happy with one of those products, call us for an authorization and return it *with all of the original packaging* within the guarantee period for a refund check (or credit on your credit card). We reserve the right to limit quantities on such returns.

We only carry the very latest versions of products so, rest assured, that's what you'll receive when you order. The version numbers shown here are based on the best available information at press time. If a newer version has come out in the meantime, or there's been a price change, we'll let you know before taking your order. Also, all software is not copy-protected, unless indicated otherwise by (CP). Finally, please refer to the four-digit number next to the product when ordering. Thanks!



Ashton-Tate
1324 FullWrite 1.0—A full-featured word processor at an incredible price. Buy now and be eligible for an upgrade to version 1.1 directly from Ashton-Tate for only the cost of shipping and handling. \$39.



Abacus Concepts ... 30 day MBG
StatView II/StatView SE+ Graphics 1.03—Statistical analysis with presentation graphics. Three time Macworld "World Class Award" Winner.
4481 StatView II 1.03 \$279.
4482 StatView SE+ Graphics 1.03 179.

DAILY BUSINESS

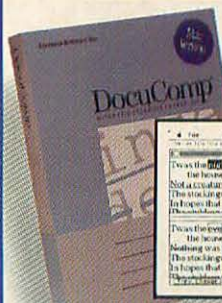
- ★ **Aatrix Software ... 30 day MBG**
- 5872 Checkwriter II 2.8 37.
- 3976 Aatrix Payroll 3.5 109.
- 3958 Aatrix Payroll PLUS 3.4 175.
- ★ **Abacus Concepts ... 30 day MBG**
- 4482 StatView SE+ Graphics 1.03 179.
- 4481 StatView II 1.03 279.
- 5840 SuperANOVA 1.1 (for Mac Plus/SE) 309.
- 5904 SuperANOVA 1.1 (for Mac II) 309.
- 5907 StatView II/SuperANOVA Bundle 569.
- ★ **Acius ... 30 day MBG**
- 6948 File Force 1.0 249.
- 5618 4th Dimension 2.0.10 465.
- 4024 4th Dimension Runtime (4 user) 249.
- ★ **Advanced Software ... 30 day MBG**
- 5608 DocuComp 1.5 89.
- ★ **A Lasting Impression**
- 5465 ResumExpert 3.01 39.
- 5749 Cover Letters 39.
- Sales & Marketing, Students, Education, Finance & Banking, Management Edition, Computer Science & Engineering, Health Services, and Arts & Leisure . . . each 39.

- Ashton-Tate**
- 1324 FullWrite 1.0 (free upgrade to 1.1) . . . 39.
- ★ **Avery ... 60 day MBG**
- 7446 MacLabel Pro 1.0 49.
- Blyth Software**
- 5492 Omnis 5 1.1 call
- ★ **Bravo Technologies ... 30 day MBG**
- 1539 MacCalc 1.2D 79.
- ★ **Chang Labs ... 30 day MBG**
- 1611 C.A.T. 3.0 289.
- ★ **Checkfree Corp. ... 30 day MBG**
- 6928 Checkfree Mac 1.5 20.
- ★ **CheckMark Software ... 60 day MBG**
- 5861 CashLedger 1.3A 115.
- 5862 Payroll 4.1 175.
- 5863 MultiLedger 1.3 235.
- Claris**
- 1129 MacWrite II 1.1 145.
- 4196 FileMaker II 1.1V2 218.
- 1125 MacProject II 2.1 365.
- Computer Associates/Bedford**
- 4977 ACC PAC Simply Accounting 1.1A . . . 225.
- ★ **Deneba Software ... 30 day MBG**
- 4700 BigThesaurus 1.0 64.
- 1768 Coach Professional 3.1 124.



A Lasting Impression
5465 ResumExpert 3.01—Professional résumé composition. 40+ fully-formatted MS Word résumé templates. Highlight the text & substitute your own information. Rated 4 Mice by MacUser. See line listing for other editions. \$39.

- ★ **Dow Jones ... 30 day MBG**
- 1786 Market Manager PLUS 2.0 \$189.
- ★ **Electronic Arts ... 30 day MBG**
- 1543 Thunder II 1.01 (Batteries Included) . . 49.
- ★ **Fox Software ... 30 day MBG**
- 5572 FoxBASE II/Mac 2.0 292.
- ★ **Franklin Software ... 30 day MBG**
- 7070 Language Master 2.0 59.
- ★ **Help Software ... 30 day MBG**
- 7485 Desktop Help for Excel 52.
- Informix**
- 4955 Wingz 1.1A 245.
- ★ **Intuit ... 30 day MBG**
- 2425 Quicken 1.5 35.
- ★ **Layered ... 30 day MBG**
- 5207 atOnce! 1.01 285.
- Insight Expert Series each 395.
- 2608 FrontDesk 6.10 Multi-User (single) . . . 59.
- ★ **Lifetree Software ... 30 day MBG**
- 6984 Correct Grammar 1.0 49.
- ★ **MECA ... 60 day MBG**
- 2796 Managing Your Money 3.0 122.



Advanced Software ... 30 day MBG
5608 DocuComp 1.5—Finds and tracks changes in different versions of word processing files or source code. It saves untold hours of marking paper by hand. \$89.

- ★ **Microlytics ... 60 day MBG**
- 2733 WordFinder 2.0 34.
- ★ **Microsoft ... 30 day MBG**
- 2866 File 2.0A 123.
- 2884 Works 2.00B 179.
- 4969 Word 4.0A 245.
- 2865 Excel 2.2A 245.
- 6500 Excel Money Mgr. Book (incl. disk) . . 25.
- 5454 The Microsoft Office 525.
- 6382 The Microsoft Office (CD-ROM) . . . 599.
- ★ **New Horizons ... 30 day MBG**
- 6262 WordMaker 1.0.1 65.
- ★ **Niles & Associates ... 30 day MBG**
- 5048 EndLink 1.1.3 58.
- 4602 EndNote 1.2.1 74.
- ★ **Nolo Press ... 60 day MBG**
- 4228 For the Record 1.03 28.
- 2981 WillMaker 3.0 32.
- ★ **Odesta ... 30 day MBG**
- 5621 Double Helix III 3.0RA 339.
- 6468 DataDesk 3.0 389.
- Paragon Concepts**
- 5683 Nisus 3.0 245.
- ★ **Portfolio Systems ... 30 day MBG**
- 6916 Dynodex 1.1 57.
- 7448 Paper for Dynodex 14.

clean up our act.

THINK C



Symantec ... 30 day MBG

3420 **THINK C 4.0**—An object-oriented C compiler complete with class libraries for creating user interfaces. Incredible speed, source-level debugging & full ANSI-standard libraries. 1988/89 SPA, Eddy, & Byte award-winner **\$165.**

★ Preferred Publishers ... 30 day MBG

- 4781 Vantage 1.5 52.
- 4780 DAtabase 1.5 68.

★ ProVUE ... 60 day MBG

- 4582 Panorama 1.5 249.

★ Reference Software ... 30 day MBG

- 6268 Grammatik Mac 2.0 50.

RightSoft

- 7482 RightWriter Mac 3.1 54.

Satori Software

- 3320 BulkMailer 3.25 75.

★ Sensible Software ... 30 day MBG

Sensible Grammar or Bookends ea. 51.

★ Softsync ... 30 day MBG

- 7129 Accountant, Inc. Professional 1.03 345.

★ Spinnaker ... 30 day MBG

- 6508 The Resume Kit 35.



Odesta ... 30 day MBG

5621 **Double Helix III 3.0RA**—The only database that speaks the Mac language you know— with no programming syntax to slow you down. Build applications that combine HyperCard-style with relational database capabilities **\$339.**

★ Survivor Software ... 30 day MBG

- 6097 InvoicIt 1.01 (reqs. MacMoney) ... \$49.
- 3289 MacMoney 3.5 59.

★ Symantec ... 30 day MBG

- 3422 More II 3.0 265.

★ Symmetry ... 30 day MBG

- 4504 Acta Advantage 1.02 63.
- 6069 KeyPlan 1.0 243.

★ Synergy ... 30 day MBG

- 6617 KaleidaGraph 2.0.2 145.

★ Systat, Inc. ... 30 day MBG

- 7409 Fastat - Coprocessor 1.1 159.
- 7408 Fastat - No Coprocessor 1.1 159.
- 7410 Systat 5.0 649.

★ TIMESLIPS ... 30 day MBG

- 2986 Timeslips III 2.0 195.

★ T/Maker ... 30 day MBG

- 3639 WriteNow 2.2 117.
- 7360 WriteNow 2.2 Corporate 3-Pak ... 245.

★ WordPerfect ... 60 day MBG

- 3800 WordPerfect Mac 1.0.3 229.

★ Zedcor ... 60 day MBG

- 6742 Desk 1.0 229.

GRAPHICS & DESIGN

★ Aapps ... 30 day MBG

- 6509 MicroTV 265.
- 7117 DigiVideo (black & white) 399.
- 7114 DigiVideo (color) 665.

Adobe Systems

- Adobe Type Library call
- 6957 Adobe Type Reunion 1.0 39.
- 5750 Adobe Type Manager 1.2 55.
- 6053 Adobe Plus Pack 109.
- 6156 Adobe Plus Pack/ATM ... special 159.
- 6098 TypeAlign for ATM 1.0.4 59.
- 6985 Adobe ATM/TypeAlign Pack 89.
- Adobe Type Set 1 or 2 each 58.
- 6931 Adobe Type Set 1 & 2/ATM Pack .. 149.
- 1137 Adobe Illustrator 3.0 349.
- 6644 Adobe Photoshop 1.0 499.
- 5605 TrueForm 2.0 225.
- 5001 StreamLine 1.2 225.
- Smart Art I, II, III, or IV each 88.

★ Aldus ... 30 day MBG

- 4751 Persuasion 2.0 329.
- 1330 FreeHand 2.02 329.
- 7467 PrePrint 1.0 329.
- 7088 PageMaker 4.0 499.

Altsys

- 5425 Art Importer 2.0 89.
- 6499 Metamorphosis 1.0 149.
- 1195 Fontographer 3.1 249.

Bitstream

- MacFontware Typeface Packages. . call

Bright Star Technology

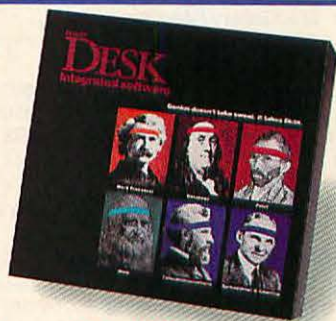
- 6093 interFACE 1.0 249.

Broderbund Software

- 1427 The Print Shop 1.3.1 35.
- 6281 TypeStyler 1.01 115.

★ CE Software ... 60 day MBG

- 7481 Amazing Paint 1.0 65.



Zedcor ... 60 day MBG

6742 **Desk 1.0**—Combines seven programs: word processing, spreadsheet with charting, database, communications, paint, draw, & time management in a set of DAs that work together & with your favorite applications. **\$229.**

Claris

- 1123 MacPaint II 2.0 92.
- 4815 Smart Form Designer 1.01V 289.
- 1117 MacDraw II 1.1 (w/ATM) 289.
- 4814 Claris CAD 1.0V5 579.

Computer Associates/Cricket

- 1668 CA-Cricket Graph 1.3.2 125.
- 1670 CA-Cricket Presents 2.0 319.

★ Creative Software ... 30 day MBG

- 6645 Easy Color Paint 1.1 42.

★ Custom Applications ... 30 day MBG

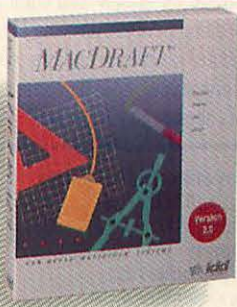
- 6517 Freedom of Press 2.4 255.

★ DeltaPoint ... 60 day MBG

- 6095 DeltaGraph 1.5 109.

★ Denaba Software ... 30 day MBG

- 6365 UltraPaint 1.0 125.
- 1769 Canvas 2.1 189.



Innovative Data Design

2417 **MacDraft 2.0**—Powerful precision drawing and design software for the Macintosh. Features include advanced text handling, on-line symbol libraries, layers, Bezier and spline curves, dimensioning and more **\$193.**

200C

MMC
The Macintosh Marketing Connection, Inc.

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/334-4444 603/446-7711 FAX 603/446-7791

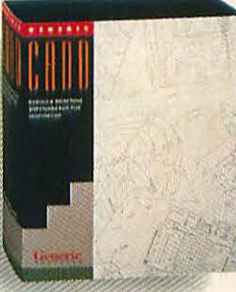
By changing the

- ★ **Dream Maker ... 30 day MBG**
 4088 MacGallery (MacPaint) \$27.
 Cliptures: Business 1 or 2 ... each 69.
Dubl-Click Software
 World-Class Fonts! each 42.
 WetPaint Clip-Art each 42.
- ★ **Electronic Arts ... 30 day MBG**
 5289 Studio/1 1.0 96.
 4315 Studio/8 1.0 295.
- ★ **Farallon Computing ... 30 day MBG**
 4684 ScreenRecorder 1.0 125.
 6770 MacRecorder Voice Digitizer 89.
 2199 MacRecorder 2.01 159.
- ★ **Foundation Publishing ... 60 day MBG**
 Comic People Vol. 1 or Vol. 2 ... ea. 21.
 6728 Comic Strip Factory 1.6 37.
- Frame Technology**
 7505 FrameMaker 749.
- ★ **Generic Software ... 60 day MBG**
 4319 Generic CADD 1.1 (Level 1) 83.
 7454 Generic CADD 1.0 375.
- ★ **Good Software ... 30 day MBG**
 5428 NuPaint 1.0.4 special 69.
- Image Club Graphics**
 7523 Evolution 49.



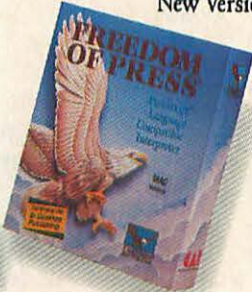
Deneba Software ... 30 day MBG
 6365 UltraPaint 1.0—B&W and color painting, gray scale editing & object drawing in one program. MacPlus' experience high res painting & every tool imaginable. Mac II's come alive with millions of colors & gray scale editing ... \$125.

- Innovative Data Design**
 2417 MacDraft 2.0 193.
 4707 Dreams 1.1 319.
- Letraset**
 2619 ImageStudio 1.5 139.
 2621 Ready Set Go! 4.5A 165.
 4709 LetraStudio 1.5 275.
 6300 FontStudio 1.0 459.
 6302 DesignStudio 1.0 599.
 6301 ColorStudio 1.0 1579.
- ★ **Linguist's Software ... 60 day MBG**
 Over 100 language fonts call
 MacKanji 6.0, MacChinese,
 LaserHebrew, or LaserGreek each 79.
- ★ **MacroMind ... 30 day MBG**
 6159 MacroMind Accelerator 125.
 5087 MacroMind Director 2.0 439.
- ★ **MicroMaps ... 30 day MBG**
 5516 MacAtlas 2.0 (MacPaint) 45.
 5514 MacAtlas EPSF 1.0 (PostScript) ... 105.
 5513 MacAtlas Professional 1.0 (PICT) ... 105.
- ★ **Microsoft ... 30 day MBG**
 2878 PowerPoint 2.01 245.




Generic Software ... 60 day MBG
 7454 Generic CADD 1.0—Only Generic CADD has the combination of simplicity and power to stay with you from first inspiration to finished drawing. Top performance for the bottom line. \$375.

- NEC**
 Image Gallery, Photo Gallery, Type
 Gallery PS (CD-ROM titles) . each 246.
 6625 Clip-Art 3D (CD-ROM) 246.
- Olduvai**
 7120 VideoPaint 1.0 279.
- PANTONE**
 7466 Process Color Imaging Guide 49.
- Paracomp**
 7421 DrawTools 1.0 62.
 4597 Swivel 3D 1.1 295.
 7441 Swivel 3D Professional 1.0 439.
- ★ **Preferred Publishers ... 30 day MBG**
 5751 Exposure 1.03 52.
- Quark**
 3230 Quark XPress 2.12 469.
- ★ **Silicon Beach ... 60 day MBG**
 3506 SuperPaint 2.0 125.
 6674 Personal Press 199.
 3980 Digital Darkroom 1.1 248.
 3507 Super3D 2.1 315.
- Softview**
 7499 if:X Forms Designer 1.0 169.
- ★ **Solutions, Inc. ... 60 day MBG**
 3446 The Curator 1.05 71.



Custom Applications ... 30 day MBG
 6517 Freedom of Press 2.4—1989 MacUser Editors' Choice Awards for Software Product of the Year and Best Graphics/Publishing Utility. Brings PostScript-printing capabilities to non-PostScript output devices. \$255.

- ★ **Somak Software ... 30 day MBG**
 7434 LaserArt CD-ROM Volume 1 \$62.
- ★ **Springboard ... 30 day MBG**
 3530 Certificate Maker 2.0 22.
 4497 Top Honors 1.01 57.
 4500 Springboard Publisher II 2.0 107.
- Strategic Mapping**
 6518 ATLAS-MapMaker 4.5 369.
- ★ **SuperMac Tech. ... 60 day MBG**
 3380 PixelPaint 2.0 225.
 5625 PixelPaint Professional 1.0 389.
- 3G Graphics**
 3942 Images with Impact: Graphics 1 ... 50.
 4583 Images with Impact: Business 1 ... 65.
 6379 Images with Impact: Accents 65.
- ★ **Timeworks ... 30 day MBG**
 7115 Publish It! Easy 1.1 113.
 5908 Publish It! 1.2 222.
- ★ **T/Maker ... 30 day MBG**
 6900 ClickArt Business Cartoons 32.
 3633 ClickArt Christian Images 39.
 5167 EPS Software Art special 69.
 7424 EPS Animals & Nature 82.



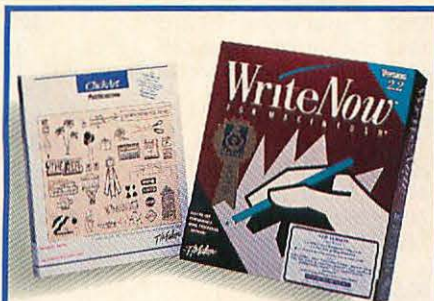
Strategic Mapping
 6518 ATLAS-MapMaker 4.5—Publication quality color maps of your data. Includes boundaries and data for states, counties, world countries. Plots locations and data for ZIP-coded address files. MacUser Five Mice rating. \$369.

- ★ **Wayzata Tech. ... 60 day MBG**
 6576 Vietnam Remembered (CD-ROM) ... 69.
 6370 Quick Art (CD-ROM) 175.
- ★ **Wildflower ... 30 day MBG**
 6512 SnapShot 2.0 32.
- ★ **Zedcor ... 60 day MBG**
 3986 DeskPaint & DeskDraw 3.0 115.

TOOLS OF THE TRADE

- ★ **Abbott Systems ... 30 day MBG**
 5236 CanOpener 1.1 63.
- ★ **Affinity Microsystems ... 60 day MBG**
 1016 Tempo II 1.02 93.
- ★ **Aladdin Systems ... 30 day MBG**
 6169 Shortcut 1.0.2 46.
 6740 StuffIt Deluxe 1.0 63.
 7504 Programmer's Assistant 1.0 57.
- ★ **ASD Software ... 30 day MBG**
 7085 FileGuard Extended 2.5 (1 user) ... 145.
 7422 FileGuard Extended 2.5 (5 user) ... 349.
 7423 FileGuard Extended 2.5 (10 user) ... 579.
- ★ **Berkeley Systems ... 30 day MBG**
 5737 After Dark 2.0 22.
 1541 Stepping Out II 2.02 49.

way that we pack.

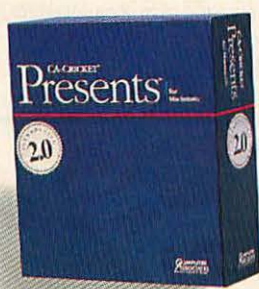


T/Maker ... 30 day MBG

3639 WriteNow 2.2—With your purchase of the Eddy award winning word processor, WriteNow 2.2, receive a FREE copy of ClickArt Publications to jazz up your memos, papers, and presentations \$117.

Borland

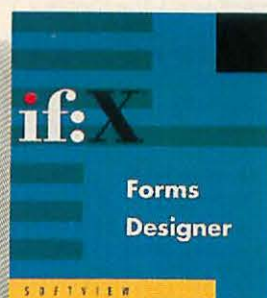
- 1511 Turbo Pascal 1.1 68.
- ★**Bravo ... 30 day MBG**
- 5404 SPAMM 1.1 48.
- ★**Casady & Greene ... 60 day MBG**
- 2269 QuickDEX 1.4D 31.
- 7443 A.M.E. 1.0 159.
- 7444 A.M.E. 1.0 (5 user) 509.
- ★**CE Software ... 60 day MBG**
- 4689 MockPackage Plus Utilities 4.4 31.
- 1727 CalendarMaker 3.0 31.
- 6278 DiskTop 4.0 63.
- 1729 QuickKeys 1.2 63.
- 7518 Alarming Events 1.0 85.
- ★**Central Point ... 30 day MBG**
- 5040 Copy II Mac 7.2 23.
- 5041 Mac Tools Deluxe 1.1 75.



Computer Associates/Cricket

1670 CA-Cricket Presents 2.0—Using CA-Cricket Presents' robust, automated features is the quickest way to integrate text, charts and graphics to create persuasive visuals for high impact presentations..... \$319.

- ★**Connectix ... 30 day MBG**
- 6123 Virtual 2.03 (for SE/30, IIcx, IIx, & IICI) \$115.
- 6122 Virtual 2.03 (for Mac II, incl. PMMU) . 188.
- ★**Dantz Development ... 30 day MBG**
- 5255 Retrospect 1.1 148.
- ★**Digital ... 60 day MBG**
- 5166 SmallTalk/V Mac 1.1 124.
- Dubi-Click Software**
- 1824 Calculator Construction Set 2.05. . . 45.
- ★**Fifth Generation ... 30 day MBG**
- 4287 PYRO! 4.0 (screen saver) 25.
- 3955 Suitcase II 1.2.6 49.
- FastBack II 2.1 or DiskLock 1.0.2. . 118.
- ★**Foundation Publishing ... 60 day MBG**
- 6701 HyperSpeller 1.0 29.
- ★**HJC/Microcom ... 30 day MBG**
- 4803 Virex 2.7 56.
- 5885 Virex (10 Pack) 329.
- Hyperpress Publishing**
- 4233 Icon Factory 1.0 45.
- ICOM Simulations**
- 4084 On Cue 1.3 35.
- 5681 HyperTMON 1.0 58.
- 4085 TMON 2.8.4 87.
- Individual Software**
- 4719 101 Scripts & Buttons HyperCard 1.2 35.
- ★**Insight Development ... 30 day MBG**
- 6171 MacPrint 1.3 94.
- ★**JAM Software ... 30 day MBG**
- 6089 Smart Alarms w/Apt. Diary 3.0.1. . 49.
- 6088 Smart Alarms 3.0 (1-4 users) 99.
- ★**Kent Marsh Ltd. ... 30 day MBG**
- 5457 QuickLock 2.0 34.
- 2591 The NightWatch 1.03 85.
- 6134 MacSafe II. 107.
- ★**Kiwi Software ... 60 day MBG**
- 6267 KiwiEnvelopes! 3.0 34.
- 7445 KiwiFinder Extender 1.0 65.
- ★**Leister Productions ... 30 day MBG**
- 7126 Reunion 1.6 89.
- ★**Loop Software ... 30 day MBG**
- 5442 PictureBook 3.2 39.
- Magic Software**
- 7267 AutoSave II 1.1 28.
- 7268 POWERIcons 1.0 39.
- 7270 Backmatic 1.1 50.
- ★**Microcom ... 30 day MBG**
- 7459 CarbonCopy Mac (Single, 2 req.) . 117.
- 7465 CarbonCopy Mac (Twin Pack) . . . 169.
- ★**Microlytics ... 60 day MBG**
- 2732 GOfar 2.0 45.
- ★**Microseeds Pub. ... 60 day MBG**
- 7068 INITPicker 2.0 35.
- 2913 Redux 1.62 49.
- 7116 Rival 1.1 49.
- ★**Microsoft ... 30 day MBG**
- 4471 QuickBasic 1.0 64.
- ★**Millenium Software ... 30 day MBG**
- 6105 HyperX 3.0 65.
- ★**Now Software ... 30 day MBG**
- 6924 ScreenLocker 1.0 45.
- 6925 Now Utilities 1.0 89.
- 6739 Prototypor 2.1 184.



Softview

7499 if:X Forms Designer 1.0—This program does for forms creation what word processing did for typing. With "Graphics Intelligence" your form layout can be done right—the first time! \$169.

Olduvai

- 4503 MultiClip 2.0 49.
- ★**ON Technology ... 1 year MBG**
- 6385 On Location 1.0 75.
- ★**Peter Norton ... 30 day MBG**
- 6748 Norton Utilities for the Mac 1.0 . . . 84.
- ★**Salient Software ... 30 day MBG**
- 7404 Disk Doubler 2.0 45.
- 7403 Partner 1.01 56.
- ★**Silicon Beach ... 60 day MBG**
- 5100 SuperCard 1.5 189.
- ★**Softstream Int'l., Inc. ... 30 day MBG**
- 5440 HyperHIT 2.2 125.
- 7450 HyperHIT Relational 269.
- ★**Software Innovations ... 30 day MBG**
- 5869 HandOff 1.1 31.
- 6647 HandOff II. 52.



RightSoft

7482 RightWriter Mac 3.1—A sophisticated system that will generate a marked-up copy of your documents with comments pointing out errors in grammar, style, word usage and punctuation \$54.

200C

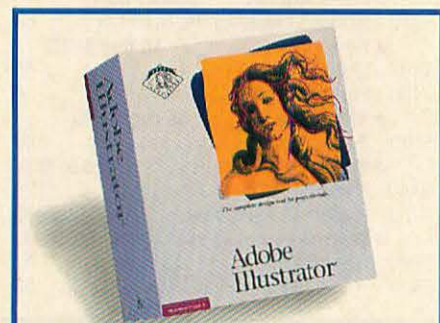
MMC
Macintosh Marketing Connection, Inc.

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/334-4444 603/446-7711 FAX 603/446-7791

Just paper and boxes.

★Solutions, Inc. ... 60 day MBG	
3448 SmartScrap & The Clipper 2.1	\$45.
3449 SuperGlue II 2.01	\$61.
★Somak Software ... 30 day MBG	
5897 ScriptEdit 1.1	49.
7430 SharpenUp 1.0	62.
★Spinnaker ... 30 day MBG	
6692 PLUS 2.0	115.
★SuperMac Tech. ... 60 day MBG	
3383 SuperSpool 5.0	58.
3382 SuperLaserSpool 2.02	87.
3378 SuperLaserSpool 5-Pack 2.02	289.
3377 DiskFit 1.5.1	58.
3379 Network DiskFit 1.5	225.
★Symantec ... 30 day MBG	
4644 Just Enough Pascal 1.0	52.
5176 Symantec AntiVirus for Mac (S.A.M.)	67.
5724 Symantec Utilities for Mac (S.U.M.)	99.
3421 THINK Pascal 3.0	165.
3420 THINK C 4.0	165.
★Symmetry ... 30 day MBG	
3318 HyperDA 1.2	45.
★Synex ... 30 day MBG	
7147 MacEnvelope 5.0	57.
6666 MacEnvelope Plus 2.0	159.
★TGS Systems ... 30 day MBG	
6667 Prograph 2.0	249.



Adobe Systems

1137 *Illustrator 3.0*—New text-handling tool allows for direct, on-screen entering and manipulation of text. Also, control every aspect of the characters, including kerning, text on a curve and access to typeface outlines. \$349.

★TML Systems ... 30 day MBG	
3549 TML Pascal II 3.1 (w/MPW 3.1)	109.
True BASIC, Inc.	
3587 True BASIC 2.02	55.
★Williams & Macias ... 30 day MBG	
6926 myDiskLabeler III 3.0	49.
4976 StickyBusiness 1.2	89.
6927 StickyBusiness Plus 1.2 (bar codes)	149.
★Zedcor ... 60 day MBG	
3985 ZBasic 5.0	88.

LEARN & PLAY

Access Software	
4655 World Class Leader Board Golf	25.
Activision	
4486 Manhole	28.
5127 Manhole (CD-ROM)	34.
5517 Cosmic Osmo	40.
★Ars Nova ... 30 day MBG	
1215 Practica Musica 2.2	69.



SuperMac Tech. ... 60 day MBG

3377 *DiskFit 1.5.1*—Copy and backup the contents of your hard drive quickly and automatically onto floppies, cartridges, or other hard drives. Multifinder compatibility allows you to keep working while you backup. \$58.

★Beacon Technology ... 30 day MBG	
6426 Gems of The Word 1.0 (King James)	25.
7442 Gems of The Word 1.0 (New Int'l.)	25.
4967 HyperBible 1.0 (King James)	145.
4968 HyperBible 1.0 (New International)	175.
★Bogas Productions ... 60 day MBG	
6135 Super Studio Session w/Music Library	99.
Bright Star Technology	
3961 Talking Tiles 1.0	26.
1402 Alphabet Blocks 1.0	30.
Broderbund Software	
4314 Typel 1.0	18.
5886 Star Wars (CP)	23.
4540 Ancient Art of War at Sea (CP)	26.
6516 The Playroom (CP)	29.
4229 Where/World Carmen Sandiego? (CP)	29.
5755 Where/Europe Carmen Sandiego? (CP)	29.
5233 Where/USA Carmen Sandiego? (CP)	29.
4966 SimCity 1.2 (CP)	29.
5871 SimCity Supreme 1.2C	47.
Geometry 1.2 (CP), Physics 1.2 (CP), Calculus 1.2 (CP)	each 58.
5237 Whole Earth Catalog (CD-ROM)	89.
★Bull City Software ... 30 day MBG	
5841 Moriarty's Revenge (CP)	32.



HJC/Microcom ... 30 day MBG

4803 *Virex 2.7 with the Virex INIT*—Both detects and repairs files infected by all known Mac viruses. The Virex INIT continuously monitors the computer to prevent infection. \$56.
5885 *Virex 10 Pack* 329.

Bullseye	
1545 Fokker Triplane 2.02 (CP)	\$23.
1544 Ferrari Grand Prix (CP)	31.
4074 P51 Mustang Flight Simulator (CP)	31.
Carina Software	
5726 Voyager 1.2	88.
★Casady & Greene ... 60 day MBG	
2268 Crystal Quest 2.2X	25.
4119 Crystal Quest w/Criter Editor 2.2X	39.
7495 Mission Starlight	29.
7498 Sky Shadow	29.
Coda Music Systems	
5854 MusicProse 1.01	187.
5604 Finale 2.0	549.
Davidson & Associates	
1734 Math Blaster! 1.0 (CP)	29.
6128 Math Blaster Mystery (CP)	29.
★Electronic Arts ... 30 day MBG	
6716 Pipe Dreams	17.
6297 Halls of Montezuma	26.
6663 Sands of Fire	32.
4064 Chuck Yeager Flight Simulator	32.
6594 Starflight	39.
1846 Deluxe Music Construction Set 2.5	84.



Timeworks ... 30 day MBG

Publish It! & Publish It! Easy—The first desktop publishing programs to fully integrate as many text, graphic and page layout features as in stand-alone programs.

7115 <i>Publish It! Easy 1.1</i>	\$113.
5908 <i>Publish It! 1.2</i>	222.

★First Byte ... 30 day MBG	
5294 Puzzle Storybook 1.0 (ages 3-8)	27.
5293 Dinosaur Discovery Kit 1.0 (ages 3-8)	27.
★Great Wave ... 30 day MBG	
2276 KidsTime 1.2 (ages 3-8)	26.
5642 KidsMath 1.1 (ages 3-8)	26.
4334 NumberMaze 1.1 (ages 5-12)	26.
2270 American Discovery 2.3 (ages 9+)	26.
2273 ConcertWare + 4.0	38.
2271 ConcertWare + MIDI 5.1	98.
★HyperGlott ... 30 day MBG	
Word Torture - Beginner to Advanced (Span., Fren., Germ., Ital. & Rus.)	ea. 29.
Pronunciation Tutor - Beginner (Spanish, French, German)	ea. 35.
Verb Tutor - Intermediate (Spanish, French, German)	ea. 42.
6604 Verbal Aspect - Inter. (Russian)	42.
7472 Russian Noun Tutor (w/sound)	59.
6611 Kanjmaster - Beg. (Japanese)	105.
7473 Learn to Speak French (CD-ROM)	175.
Individual Software	
7425 Training for Microsoft Word 4.0	26.
4990 Training for PageMaker 3.0	26.

Nothing obnoxious.



HyperGlot ... 30 day MBG

7473 *Learn To Speak French* (CD-ROM)—Parlez! A complete French course with 35 interactive lessons on two CD-ROMs. Four native speakers reading dialogues based on the Foreign Service Institute curriculum. Perfect learning tool \$175.

★Inline Design ... 30 day MBG

5870 Bomber 1.3 (includes headphones) 32.

★Knowledge Revolution ... 90 day MBG

7310 Interactive Physics 169.

★Learning Company ... 30 day MBG

2670 Reader Rabbit 2.2 (CP) (ages 4-7) 30.

5453 Talking Math Rabbit 1.0 (ages 4-7) 30.

MicroProse

4697 Pirates! (CP) 35.

★Microsoft ... 30 day MBG

2868 Flight Simulator (CP) 32.

Miles Computing

5253 The Puzzle Gallery 26.

2765 Fool's Errand 32.

Mindscape

4083 Balance of Power 1990 (CP) 29.

3987 Colony (CP) 29.



Salient ... 30 day MBG

7404 *Disk Doubler 2.0*—Expand your disk drive capacity. Fast, easy and safe, Disk Doubler dramatically increases the storage capacity of any Mac drive. "Performance is outstanding" evaluates *Mac User*, 7/90. (4½ Mice rating) \$45.

4596 Deja Vu II (CP) 29.
2743 Crossword Magic (CP) 29.

★Penton Overseas ... 30 day MBG

VocabuLearn/ce Levels I & II
(French, Italian, Spanish, German,
Russian, Hebrew, & Japanese). ea. 35.

★Personal Training Sys. ... 60 day MBG

MacConnection carries the entire line of
PTS modules for Excel 2.2, Word 4.0,
HyperCard, Persuasion 2.0, PageMaker
4.0, Illustrator 88, FileMaker II, FreeHand
2.02, and the Macintosh . . . each 52.

Postcraft

7395 Citadel Secrets 9.

6466 Citadel 26.

Premier Technology

5773 Strategic Conquest Plus 2.0 34.

5774 NetTrek—The Real Version 2.3 34.

Sierra On-Line

7366 Thexder 21.

3397 Leisure Suit Larry (CP) 23.

5694 Manhunter: San Francisco (CP) 28.

5458 Manhunter: New York (CP) 28.

3396 King's Quest III (CP) 28.

7367 Space Quest III (CP) 39.

★Silicon Beach ... 60 day MBG

3502 Beyond Dark Castle 32.

3503 Dark Castle 1.1 32.

★Softstream Int'l., Inc. ... 30 day MBG

4071 MacMan 23.

6258 MacRummy 32.

4073 Colour Billiards 38.

★Software Toolworks ... 30 day MBG

4945 The Hunt for Red October 1.1 20.

1842 Chessmaster 2100 1.1 32.

4619 Mavis Beacon Typing 1.3 (CP) 32.

4588 Life & Death (CP) 32.

6111 Cribbage King-Gin King 39.

★Spectrum Holobyte ... 30 day MBG

4001 Solitaire Royale 19.

3464 Tetris 1.1 19.

6112 Welltris 19.

3459 Falcon 2.2 30.

★Spinnaker ... 30 day MBG

2328 Sargon IV (CP) 28.

2329 SAT Score Improvement 1.0 (CP) 57.

True BASIC, Inc.

3571 Algebra 3.02 (with workbook) 45.

★Wayzata Tech. ... 60 day MBG

6369 The World Factbook 1989 (CD-ROM) 69.

7374 Sport News Baseball Stats (CD-ROM) 139.

★XOR ... 30 day MBG

6152 TaskMaker (CP) 27.

6040 MacGolf Classic (CP) 52.

NETWORKS & COMMUNICATIONS

★Abaton ... 30 day MBG

6266 InterFAX 24/96 Modem 419.

★CE Software ... 60 day MBG

5638 In/Out (10 user) 187.

5174 QuickMail 2.2 (5 user) 215.

5173 QuickMail 2.2 (10 user) 315.



ASD Software ... 30 day MBG

7085 *FileGuard Extended 2.5*—Protect your hard drives, applications, files/folders (including system folder) from unauthorized access, deletion, and/or illegal copying. Now with system usage audit trail. 5 & 10 user also available. . . . \$145.

★CompuServe ... 60 day MBG

1676 CompuServe Information Service 23.

1673 CompuServe Navigator 3.0 49.

1674 Standard Service/Navigator Bundle 69.

Connect, Inc.

5834 Connect 1.5 for the Macintosh 63.

★DataViz ... 60 day MBG

1823 MacLink Plus/PC 4.5 119.

4842 MacLink Plus/Translators 4.5 99.

★Dove Computer ... 60 day MBG

6758 DoveFax Desktop 279.

FastNet III, SE, or SE/30 . . . each 375.

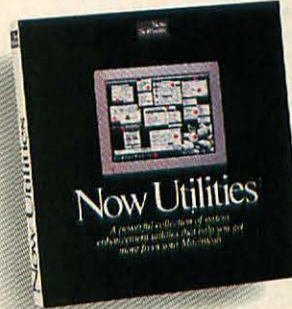
★Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Package 24.

1785 Desktop Express 1.03 95.

★Farallon Computing ... 30 day MBG

5707 Timbuktu 3.1 95.



Now Software ... 30 day MBG

6925 *Now Utilities 1.0*—A collection of 12 system enhancement utilities. Flash appointment reminders, display pictures on your Mac, pop-up the menu bar anywhere, make Font menus WYSIWYG, and much more! . . . \$89.

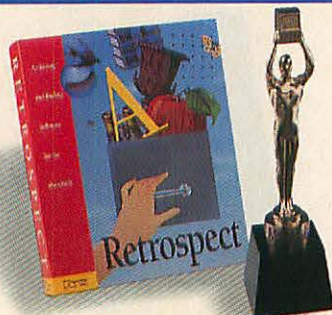
200C

MMG
of the Macintosh Marketing Association, Inc.

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/334-4444 603/446-7711 FAX 603/446-7791

No more foam



Dantz Development ... 30 day MBG
 5255 Retrospect 1.1—1989 MacUser Editors' Choice Award for Best Backup Software.
 "Retrospect can quickly store data on almost every backup medium. It also makes backup chores as painless as possible" \$148.

4866	Timbuktu/Remote 1.0.1	123.
6371	Timbuktu/Remote Access Pack	845.
4867	Timbuktu 30-Pack 3.1	1285.
2202	PhoneNET to LocalTalk Adapter	8.
5664	PhoneNET StarConnector	17.
6273	PhoneNET StarConnector 10-Pack	129.
2203	PhoneNET Connector (DIN-8)	31.
4869	PhoneNET Connector 10-Pk (DIN-8)	198.
5251	PhoneNET CheckNET	64.
2206	PhoneNET StarController 300	825.
6687	PhoneNET StarController-EN	1599.
5893	Portable Pack	329.
6778	Remote/Wakeup Cable	33.
6766	MediaTracks	189.
6767	MediaTracks Multimedia CD Pack	319.
6768	MediaTracks Multimedia Pack	319.

*Freesoft ... 60 day MBG		
6115	White Knight 11.6	85.
Hayes		
2300	Smartcom II 3.1C	84.
2307	Smartmodem 2400	349.
6655	V2400 Baud Modem	469.
5991	V9600 Baud Modem	759.
Insignia Solutions		
7058	SoftPC-AT/EGA Module	125.
4089	SoftPC 1.3	245.
6688	SoftPC for the Mac Portable	245.
Intel Corporation		
5119	2400EX Modem	179.
6265	2400EX with QuickLink II	195.
6420	2400EX MNP Modem	229.
6650	2400EX MNP with QuickLink II	249.

*Microsoft ... 30 day MBG		
5858	Microsoft Mail 2.0 Workstation	83.
5856	Microsoft Mail 2.0 Server	245.

*Nuvotech ... 60 day MBG		
3000	TurboNet ST (DIN-8)	30.
6751	TurboNet ST (12-Pack)	279.
5277	TurboBridge	319.
6272	NuvoLink SC	309.
6750	NuvoLink II	275.
6261	TurboStar	1095.

Orchid Technology		
6949	OrchidFAX Modem	459.

*Practical Peripherals ... 30 day MBG		
3102	2400 Baud External Modem	179.
5285	PM 2400SA MNP Modem	209.
3089	Mac Communications Pack 1.5	225.

*Shiva ... 30 day MBG		
3444	NetSerial X232	\$275.
4347	NetBridge	339.
4942	TeleBridge	339.
3443	NetModem V2400	429.
6917	NetModem V.32	1429.
6519	EtherGate	1629.

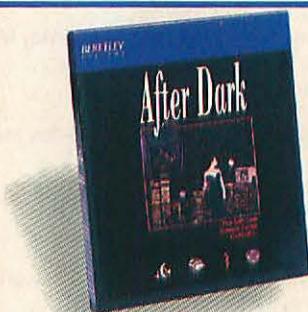
*Software Ventures ... 30 day MBG		
3455	MicroPhone II 3.0	215.

*Solutions, Inc. ... 60 day MBG		
6721	MailMaker 5 User Pack 1.1	117.
4308	BackFAX (reqs. Apple FAX modem)	139.
6720	FAXGATE Plus 1.1	239.

*Synergy ... 30 day MBG		
6618	VersaTerm 4.1.1	88.
6619	VersaTerm-PRO 3.1.1	174.

*TOPS ... 30 day MBG		
4188	TOPS Teleconnector (DIN8)	23.
4598	TOPS FlashBox	118.
3723	TOPS Mac 2.1 (limited supply)	137.
3720	TOPS Flashcard	155.
7057	MacPrint TOPS Network Version 1.0	165.
6264	TOPS Networking Bundle 3.0	187.

*Traveling Software ... 60 day MBG		
3729	LapLink Mac III Connectivity Pac.	119.
6741	LapLink Mac III Network Pac.	185.



Berkeley Systems ... 30 day MBG
 5737 After Dark 2.0—New! Over 30 displays & SOUND. Ticking clocks, thunder, munching worms. Use company logo, messages. Great Fish, Flying Toasters, & MultiModule. Random display, & password sleep. \$22.

INPUT/OUTPUT

*Abaton ... 30 day MBG		
7432	300/GS Flatbed Scanner	1099.
7433	Scanner Kit w/Digital Darkroom	259.
7431	Scanner Kit w/ImageStudio	259.

*American Power ... 30 day MBG		
5895	UPS 110SE	209.
6686	UPS 370ci	295.

Apple Computer		
6717	MIDI Interface	84.
6714	Apple Hi Res Color 13" Monitor	849.

Brother International		
6934	HL-8PS Laser Printer	3299.

Caere		
4476	OmniPage 2.1	539.
	OmniSpell or OmniDraft	each 69.
	OmniTrace or OmniProof	each 105.

*CH Products ... 30 day MBG		
7343	Mach IV Plus Joystick (Quad or ADB)	51.
7344	Rollermouse (ADB)	79.



ICOM Simulations
 4084 On Cue 1.3—Easy-to-use utility which adds a list of programs, and attached documents, directly onto your menu bar so you can move swiftly and easily from application to application. A lifesaver w/MultiFinder \$35.

*CoStar ... 30 day MBG		
6090	LabelWriter	185.
6067	LabelWriter Labels	11.
7452	LabelWriter Labels (12-Pack)	63.

*Datadesk ... 30 day MBG		
1818	HyperDialer	32.
6901	Switchboard (modular keyboard)	175.
6815	Function Key Module	39.
6813	Modular Trackball	119.
	MAC-101 Keyboards	each 129.

*Forte Communications ... 30 day MBG		
7317	Remote Keyboard/Mouse	289.

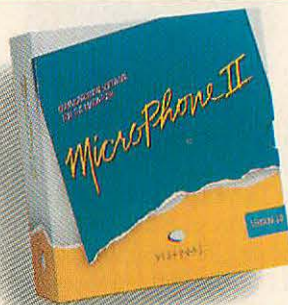
*GDT Softworks ... 30 day MBG		
6256	PrintLink Collection 3.01	59.
6151	JetLink Express 1.2	89.
6257	JetLink/Expressive Fonts Bundle	159.

Hewlett Packard		
6514	HP DeskWriter Printer	859.
6689	HP DeskWriter & ATM Bundle	889.

*Kensington ... 30 day MBG		
	Turbo Mouse 3.0 (Plus or ADB) ea.	109.

Koala		
2593	MacVision 3.0	259.

Kodak		
6730	DICONIX M150 Plus Printer	489.



Software Ventures ... 30 day MBG
 3455 MicroPhone II 3.0—New version of top-selling telecom software. Build graphic front-ends to remote services & corporate mainframes. Supports XCMDs & XFNCs, ZMODEM, icons, European languages, color & sound \$215.



"The last foam peanut you'll ever see from us."

Dear Customer,

Living in rural New Hampshire, we always felt that we had an appreciation for nature. But recently we, like many others, have started taking a long hard look at the impact of our activities on the environment. So we've stopped using foam peanuts to pack our

shipments. Instead, we are using tighter-fitting boxes and, when necessary, newsprint as a packing material. We are also working on other ways to clean up our act. Over the last few months we've found ways to recycle and re-use over 75% of what used to go in our dumpster. And this is

definitely the last styrofoam peanut you'll ever see from us.

Pat Gallup, President
MacConnection

MacConnection®

1-800/334-4444

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/334-4444 603/446-7711 FAX 603/446-7791

© Copyright 1990 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH.

Call 800/334-4444.



Cutting Edge ... 30 day MBG

45 Meg Removable Drive—Offers the convenience of removable media with the reliability of Winchester technology. Features the popular Syquest mechanism and includes one cartridge \$699.
45 Meg Removable Cartridge 89.

★MAXELL ... 60 day MBG

2792 3 1/2" DS/DD Disks (10) 14.
2793 3 1/2" HD Disks 1.44 Meg (10) 27.

★3M ... 60 day MBG

3943 DC2000 40 MB Data Cartridge 20.

★MacConnection ... 60 day MBG

6592 44 Meg. Removable Cartridge 85.

ACCESSORIES

Apple Computer

1114 LaserWriter Plus Toner Cartridge ... 99.
1115 LaserWriter II Toner Cartridge 105.

★Avery ... 60 day MBG

4864 Disk Labels 3 1/2" (Qty. 250) 13.
5392 Disk Labels 3 1/2"-Laser (Qty. 630) 29.
4865 Address Labels 3 1/2" x 1 5/16" (3750) 15.
4811 Transparencies 8 1/2" x 11" (Qty. 50) 22.
4807 Laser Labels 1" x 2 5/8" (Qty. 3000) 24.

★Basic Needs ... 60 day MBG

Dust Covers call
Hard Top Keyboards each 15.
6682 Hard Top ImageWriter II 16.
7413 Mac IIcx/ci Monitor Stand 47.
7417 MacMouse (cordless mouse) 89.

★Computer Coverup ... 60 day MBG

1723 ImageWriter II Cover \$8.
1725 Mac SE Ext. Keyboard Cover set. ... 10.

★CoStar ... 30 day MBG

7453 The Organizer Jr. 69.
6091 The Organizer 199.

Curtis Manufacturing

6733 GFP-3 (Glass Filter Plus-Mac Plus, SE) 65.

★Goldstein & Blair ... 30 day MBG

2267 The Macintosh Bible (3rd Edition) ... 19.

★I/O Design ... 30 day MBG

2379 MacLuggage Imageware II. 49.
2376 MacLuggage Macinware Plus 59.
2381 MacLuggage Macinware SE 75.
6129 The Ultimate SE/Ext. Carrying Case 79.
Neon Ultimate SE/Ext. (available in pink, green, or yellow) each 89.

★Kensington ... 30 day MBG

4643 Mac II Stand and Cable Kit 64.
2573 Tilt/Swivel (platinum) 22.
4973 Power Tree 20 27.
2559 Apple Security Kit 33.
2566 System Saver Mac (platinum) 63.
2567 System Saver Mac (beige) 63.



Nutmeg Systems ... 30 day MBG

Nutmeg 19—Monochrome two-page display for your Mac SE, SE/30, or II. ACrisp 72 dpi and 78 hz refresh rate make it ideal for DTP. Features platinum case and anti-glare screen coating. \$995.

2546 A-B Box (DIN-8) 63.
6763 SE Radiation/Anti-Glare Filter 52.
5064 Apple Color Monitor Polarizing Filter 63.
PowerBackers call

★MacConnection ... 60 day MBG

4623 Solid Oak Disk Case (holds 90 disks) 32.

★Mobius Technologies ... 60 day MBG

4470 Fanny Mac QT 55.

★Moustrak ... 60 day MBG

2694 Moustrak Pad (standard 7" x 9") ... 8.
2692 Moustrak Pad (large 9" x 11") 9.

Ribbons

3255 ImageWriter II Ribbon Black 4.
3261 ImageWriter II Ribbon Multi-4-Color . 9.
3270 ImageWriter II Rainbow 6-Pack 20.
3260 ImageWriter LQ Black Ribbon 17.

★Sopris Softworks ... 60 day MBG

4019 Mac SE & Ext. Keyboard Cover (navy) 15.
4017 ImageWriter II Cover (navy) 11.
4018 LaserWriter II Series Cover (navy) ... 17.
4012 High Trek ImageWriter Carry Case ... 49.
4013 High Trek Mac Plus Carry Case 59.
4014 High Trek Mac SE & Ext. Kybd. Case 69.
4862 SE Protection Pak (ext. keyboard) ... 75.



Practical Peripherals ... 30 day MBG

3089 Mac Communications Pack 1.5—External 2400SA Modem, cable, and top-selling communications software. Hayes compatible, auto-answer. \$225.

★Targus ... 60 day MBG

3618 ImageWriter II Carry Case 45.
3617 Mac Plus/SE Carry Case 55.
4015 Mac SE & Ext. Kybd. Carry Case ... 69.

★Tripp Lite ... 30 day MBG

6200 Isobar 6 (surge suppressor, 6 outlets) . 59.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order (in the U.S.).
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped First Class Mail.
- International orders U.S. \$250 minimum.
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment of your order.
- Corporate P.O.s accepted subject to credit approval.
- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- To order, call us anytime Monday through Friday 8:00 AM to 1:00 AM EST, or Saturday 9:00 AM to 5:30 PM EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 AM to 5:30 PM EST.

SHIPPING

Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all credit card orders phoned into MacConnection weekdays by 8 PM EST will ship Airborne Express the same night for delivery the next business day, except for those within UPS Ground Zone 1 (which is also an overnight service). Saturday delivery available to many areas upon request. Some areas require an additional day delivery. The total freight charge on any order placed with MacConnection is only \$3.
Hawaii, Alaska, Canada, Puerto Rico and U.S. Virgin Islands: Call 800/334-4444 for information on shipping and charges.
All other areas: Call 603/446-7711 or FAX 603/446-7791 for information.



Farallon Computing ... 30 day MBG

5707 Timbuktu 3.1—Features a multiple window capability which allows a Mac to view and control other Macs on a network simultaneously. A great brainstorming tool. Ideal for business and teaching environments ... \$95.

peanuts or plastic.

★Kraft Systems ... 60 day MBG

- 7519 KM30 ADB Joystick \$49.
6099 ADB Trackball (with foot pedal) 79.

★Logitech ... 30 day MBG

- 5082 ScanMan Mac Model 32 319.

Magnavox

- 6693 9CM080 14" Color Monitor. 529.
6690 14" Color Monitor with Micron Xceed
for SE/30 (640 x 480) special 849.
6691 14" Color Monitor with Micron Xceed
for Mac II (640 x 480) special 849.

★Micron ... 30 day MBG

- 6680 Xceed for SE/30 (640 x 480) 349.
6673 Xceed for SE/30 (1024 x 768) 589.
7149 Xceed Ilici-128 Cache Card 589.

★MicroSpeed ... 30 day MBG

- 6620 MacTRAC 65.
6621 MacTRAC ADB 75.

★Mouse Systems ... 30 day MBG

- 7520 Little Mouse 75.

★Nutmeg Systems ... 30 day MBG

- 6240 30/2 Interface (SE/30 video board) 499.
2994 15" Monitor for Mac SE 599.
6168 15" Monitor for Mac SE/30 599.
2993 15" Monitor for Mac II 599.
4003 19" Monitor for Mac SE 995.
7152 19" Monitor for Mac SE/30 995.
4004 19" Monitor for Mac II 995.



Insight Development ... 30 day MBG

6171 MacPrint 1.3—Lets you use any HP printer with your Mac. For a limited time, buy MacPrint 1.3 and get MacEnvelope 4.2, an envelope printing utility, absolutely free. \$94.

Olduvai Software

- 3034 Read-It! OCR 2.1 245.

★Orange Micro ... 30 day MBG

- 3036 Grappler (9 pin) 78.
6229 Grappler LX 128.

Pacific Data Products

- 7412 MacPage PE 459.
7411 MacPage 425.

RasterOps

- 7464 ColorBoard 208 395.
7463 ColorBoard 264 for Mac II 595.
7469 ColorBoard 264 for SE/30 719.
7457 Video ColorBoard 364 1595.
7468 ClearVue/GE System for Mac II 1759.
7458 ColorBoard 708+ 16" Monitor 3599.
7462 RasterOps 8L 799.
7461 RasterOps 24L 3195.

SAFE Power Systems

- 4561 SAFE 250 Watt Backup 199.
6747 SAFE 400S Watt Backup 409.



DataViz ... 60 day MBG

1823 MacLink Plus/PC 4.5—Transfer and translate files, in either direction, between the Macintosh and DOS, NeXT, OS/2, and Sun formats. Includes over 100 translators. \$119.
4842 MacLink Plus/Translators 4.5 99.

TheComplete PC

- 6104 Half-Page Scanner/400 295.
6103 Full-Page Scanner (w/OmniPage SE) 758.
Thunderware
3648 ThunderScan Plus ThunderWorks. 199.
4994 LightningScan 400 385.

MEMORY & DRIVES

1 Meg SIMMs ... 2 year warranty

- 1107 1 Meg SIMMs (80ns) 69.
7502 1 Meg SIMMs for Mac IIfx (80ns) ... 95.
7497 4 Meg SIMMs for Mac IIfx (80ns) ... call

Apple Computer

- 6707 Mac Portable 1 Meg. Exp. Kit 429.

CD Technology

- 6983 CD-ROM Porta Drive 649.

★Cutting Edge ... 30 day MBG

- 3989 800K External Disk Drive 149.
5133 20+ Meg Hard Drive 309.
3990 30+ Meg Hard Drive 379.
3991 45+ Meg Hard Drive 435.
5275 60+ Meg Hard Drive 469.
5276 80+ Meg Hard Drive 529.



Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Package—Allows off-line set up of personalized reports to retrieve and analyze key data from Dow Jones News/Retrieval's 55+ databases. Includes five free hours of connect time \$24.

- 5456 45 Meg Removable Drive \$699.
5736 45 Meg Removable Cartridge 89.

★Dove Computer ... 60 day MBG

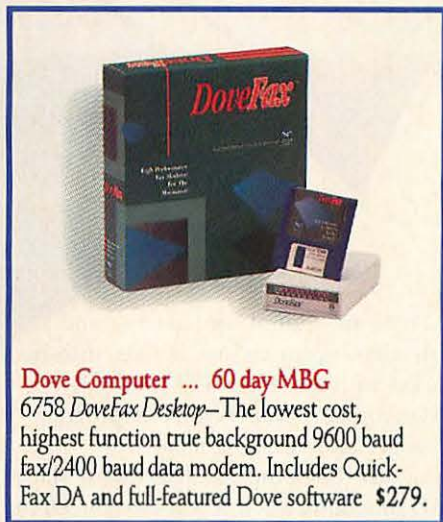
- 1802 Dove Tool Kit 15.
1801 SCSI Interface/Port 109.
6726 MaraThon MultiComm 319.
6725 MaraThon 030 for Mac II 449.
6724 MaraThon 030 for SE 449.
6723 MaraThon 030 for Plus 449.
7305 MaraThon 030 for Mac IIfx 449.
1809 MacSnap 524S 239.
1812 MacSnap 548S 479.
7503 Cache Card for Mac IIfx 589.
6973 MacSnap 2S call
6975 MacSnap 4S call
1813 MacSnap 8S call

★Kenneth Tech. ... 30 day MBG

- 5631 Rapport 195.
5632 Drive 2.4 (includes FastBack II) ... 325.

★Micron ... 30 day MBG

- 7149 Xceed Ilici-128 Cache Card 589.



Dove Computer ... 60 day MBG

6758 DoveFax Desktop—The lowest cost, highest function true background 9600 baud fax/2400 baud data modem. Includes Quick-Fax DA and full-featured Dove software \$279.

NEC

- 7352 Battery Pack for CDR35 59.
6744 CDR35 CD-ROM Portable Drive .. 399.
6743 Mac Driver Kit 64.

★Pacific Rim ... 30 day MBG

- 7382 Platinum 800k Drive 149.

Quantum

- 7521 Quantum 40 Meg Internal Drive .. 399.
7522 Quantum 80 Meg Internal Drive ... 659.

★SuperMac Tech. ... 30 day MBG

- 5447 Dataframe XP 30 Hard Drive 599.
5448 Dataframe XP 60 Hard Drive 799.
5449 Dataframe XP 100 Hard Drive ... 1049.
7451 Dataframe XP 200 Hard Drive ... 1399.
5451 Dataframe XP 330 Hard Drive ... 2369.

Toshiba

- 6749 XM 3201 CD-ROM Drive 899.

STORAGE MEDIA

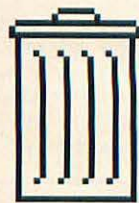
★Sony ... 60 day MBG

- 3297 3 1/2" DS/DD Disks (10) 13.
6148 3 1/2" DS/DD Disks 3 Pak (30) ... 30.
3298 3 1/2" HD Disks 1.44 Meg (10) ... 22.
6375 3 1/2" HD Disks 3 Pak (30) 56.
6659 QD2000 40 MB Data Cartridge ... 19.

Once you put MiniCad+ on your desktop...



All your other CAD software will go here.



Trash

There are a lot of contenders—and pretenders—coming into the Macintosh market with so-called “full-featured” CAD programs. But there’s one program these imitators won’t compare to: MiniCad+. It set the standard for all Mac CAD programs when it was introduced in 1986, and continues to set the pace in Macintosh-aided design.

Discover Our Dimensions

MiniCad+ is an award-winning 2D/3D package. Whether you’re designing a house or high-tech mousetrap, you’ll find the precision you need.

Smarter than the Average Mouse

Our “Smart Cursor” automatically highlights, identifies and aligns relevant snaps, intersections, tangents and parallels. Snap to the precise point every time with more ease than you’ve experienced with any other program. We built the brains into MiniCad+ so you can think of more important things.



Click with Intelligence

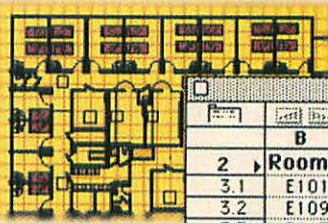
Track, Compare, Analyze

Unlike any other drawing program, MiniCad+ provides an integrated worksheet—literally, a spreadsheet and database in one—hot-linked to your drawings. Attach records such as type, cost, P.O. number or size and display at will. As you change an object’s attributes, the worksheet will automatically be updated. Compute area calculations, compile parts schedules and develop cost estimates. No longer will you tediously count objects in your drawing manually—the worksheet will count it for you.

Programmability

Don’t be confined by your CAD program. Extend the capability of MiniCad+ by developing your own palettes with our macro language. You can create your own Facilities Management palette, for instance. We’ve included a

wide variety of special-topic palettes with MiniCad+; others are available from third-party vendors.



Space Plan					
	B	C	D	E	F
2	Room	Area	Cost	Total	
3.1	E101	960.12	\$96	\$92184	
3.2	E109	512.56	\$51	\$26272	
3.3	E115	245.64	\$25	\$6034	
3.4	E111	469.26	\$47	\$22020	
3.5	E103	917.28	\$92	\$84141	

Draw on Our Experience

Packed with features, the only thing small about MiniCad+ is the price. There’s not another high-precision, professional package with such a low price tag.

MiniCad+ is the price/performance leader in Macintosh CAD, so don’t throw your money in the Trash. You owe it to your crowded desktop to ask your favorite distributor for MiniCad+, or call us for more information.

Circle 177 on reader service card

Graphsoft

8370 Court Ave., Suite 101 • Ellicott City, MD • 21043 • (301) 461-9488 • FAX (301) 461-9345

Canada: (604) 380-6911; Great Britain: (41) 71 731 7930; Australia: (61) 7 369-1204; Japan: (81) 3 360 6531

ART BEAT

by Cathy Abes

The tools and the talent behind *Macworld's* graphics and the techniques that make them possible

Artist: A silk-screen artist from upstate New York, Scott Baldwin began using the Mac when he started doing illustrations for *Macworld* four years ago. Because the silk-screening process of creating a separate screen for each color is similar to the way *Macworld* illustrations were done before the advent of the color Mac II, Baldwin was able to make an easy transition from traditional illustration methods to Mac-generated art.

Tools: Mac IIcx with 8MB of RAM and a 105MB Cirrus hard disk, a 12-by-12-inch Kurta graphics tablet, SuperMac ColorCard/24, SuperPaint 2.0, PixelPaint Professional.

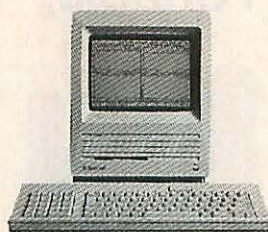
How It Was Done: For the illustration that opens our feature about navigating online services, Baldwin created a simple but appealing drawing with a textured background that evokes the feel of a woodcut. He began in SuperPaint by drawing a square the size of the finished illustration and filling it with black. Then with the 2-pixel-square brush, he drew (in white) the thin lines that define the various images in the illustration.

Once he had a finished black-and-white image, it was time to add color. So after saving the drawing in SuperPaint's PICT format, Baldwin opened the file in PixelPaint Professional. He chose two colors for each object or part of the drawing—such as the door, the background, and the man in the bathrobe. For example, for the man's face, he wanted a darker flesh (continues)



This is how the original black-and-white SuperPaint illustration looked after Baldwin imported it into PixelPaint Pro (left). Before pouring colors, he cut connecting lines to contain those colors in particular sections (right).

Macintosh TO UNISYS MAINFRAME CONNECTIVITY



The Personal Emulation Package (PEP™) allows a Macintosh to emulate the entire family of UNISYS

(Sperry) terminals (UVT112X and UTS 20, 30, and 40) for connectivity to Series 1100/2200 and System 80 mainframes. PEP features multi-session support, integrated printing, line monitor to disk, cut & paste, macro-key programming and a fully dynamic configuration. PEP supports both synchronous and asynchronous communication via multiplexers or modems.

*Try PEP, the leader in UNISYS connectivity since 1984.
To order call 1-800-829-2810*



Macintosh is a registered trademark of Apple Computer Inc.

The following are proprietary trademarks: UNISYS (UNISYS Corporation); PEP (Computer Logics).



**MICRO-TO-MAINFRAME,
WE MAKE SENSE**

Computer Logics Limited
75 International Blvd.
Rexdale, Ontario, Canada M9W 6L9
(416) 674-1111 Fax: (416) 674-1130
Computer Logics' Worldwide Offices:
• Australia • Canada • Germany • Hong Kong
• Japan • Sweden • United States

Circle 103 on reader service card.

CHECK OUT THE 'EYES



**Introducing the new ComputerEyes/Pro series
video digitizers: Full 24-bit color capture
for your Macintosh - only \$449.95!**

Easily captures beautiful color or b/w images from any video camera, VCR, etc. Use captured images in any desktop publishing program, with HyperCard, or any Macintosh print or image enhancement program (Studio/8, Digital Darkroom, PhotoMac, etc.) You won't believe your 'Eyes! Unbelievably easy to use - unbeatable image quality.

Two models now available -
Grayscale (b/w) for any Macintosh - only \$249.95

New full 24-bit color ComputerEyes/Pro for Mac II - only \$449.95

For information, demo disk, call 617 329-5400

To order, call 1-800-346-0090

Digital Vision, Inc.
270 Bridge Street
Dedham, MA 02026

COMPUTEREYES

Circle 242 on reader service card.

Now you can have color
for your MAC Portable,
PLUS or SE...



ScauzzyGraph™ Display
Controller Gives You...

- A large screen for your MAC (Color or Monochrome)
- Easy installation (Plugs into the SCSI port)
- A powerful graphics accelerator

Call today 1-800-365-AURA

Aura Systems, P.O. Box 4576, Carlsbad, CA 92008

Circle 120 on reader service card.

PINPOINT YOUR PROSPECTS.

Advertisers

interested in

renting

MACWORLD's

Subscriber List,

Please call

Kevin Normandeau

IDG List Services

1.800.343.6474

for MA 508.879.0700



After he cut the lines connecting the man's face to his hair, and his neck to his bathrobe, Baldwin poured in the dark flesh tone for the face (top left); next he poured the colors for the hair, the bathrobe, and the lines in the background (top right); and then the lighter flesh tone for the rest of the face (bottom left). This is how the man looks in the finished illustration (bottom right).

tone in the areas that had been black in the original drawing and a lighter flesh tone in all the white areas—the lines he had carved out with the brush in SuperPaint.

But because he didn't want to fill up the entire black area with the darker flesh tone, Baldwin had to first cut any lines that were connected to other lines or areas that were black, such as the man's hair. For this process, he used PixelPaint Pro's 2-pixel-square brush and the 1-pixel-wide pencil (for the smaller areas) with the dark flesh tone. Consequently, those unconnected areas remained unchanged when he later poured the dark flesh tone into the face. He repeated the line-cutting process with each part of the drawing. Finally, after making

all the cuts, he poured the colors one by one for each object, first pouring the darker color, then the lighter one.

Baldwin found the SuperMac 24-bit color board especially useful for the laborious line-cutting process. Because it creates a virtual screen of the entire screen, he could instantly zoom in to 200 percent. And by moving the mouse to the edge of the screen, Baldwin said, he could quickly pan the entire image at that same percentage. "It was like looking at the whole illustration through a magnifying glass."

Of the approximately ten hours Baldwin spent on the illustration, six to eight hours were devoted to the drawing in SuperPaint and the rest was spent on the colorization process. ■

You can't always choose the data you have to manage.

1100 0014
24 JOURNAL
1378
P0001

DEC 1999

By Sales Area: Region: Territory: Dealer
Sales Representative: Name: 01 of 1,127

By Sales Area: Region: Territory: Dealer
Sales Representative: Name: 01 of 1,127

DATE	AMOUNT	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
01/01/99	100.00											100.00
01/02/99	200.00											200.00
01/03/99	300.00											300.00
01/04/99	400.00											400.00
01/05/99	500.00											500.00
01/06/99	600.00											600.00
01/07/99	700.00											700.00
01/08/99	800.00											800.00
01/09/99	900.00											900.00
01/10/99	1000.00											1000.00
01/11/99	1100.00											1100.00
01/12/99	1200.00											1200.00
01/13/99	1300.00											1300.00
01/14/99	1400.00											1400.00
01/15/99	1500.00											1500.00
01/16/99	1600.00											1600.00
01/17/99	1700.00											1700.00
01/18/99	1800.00											1800.00
01/19/99	1900.00											1900.00
01/20/99	2000.00											2000.00
01/21/99	2100.00											2100.00
01/22/99	2200.00											2200.00
01/23/99	2300.00											2300.00
01/24/99	2400.00											2400.00
01/25/99	2500.00											2500.00
01/26/99	2600.00											2600.00
01/27/99	2700.00											2700.00
01/28/99	2800.00											2800.00
01/29/99	2900.00											2900.00
01/30/99	3000.00											3000.00
01/31/99	3100.00											3100.00
01/32/99	3200.00											3200.00
01/33/99	3300.00											3300.00
01/34/99	3400.00											3400.00
01/35/99	3500.00											3500.00
01/36/99	3600.00											3600.00
01/37/99	3700.00											3700.00
01/38/99	3800.00											3800.00
01/39/99	3900.00											3900.00
01/40/99	4000.00											4000.00
01/41/99	4100.00											4100.00
01/42/99	4200.00											4200.00
01/43/99	4300.00											4300.00
01/44/99	4400.00											4400.00
01/45/99	4500.00											4500.00
01/46/99	4600.00											4600.00
01/47/99	4700.00											4700.00
01/48/99	4800.00											4800.00
01/49/99	4900.00											4900.00
01/50/99	5000.00											5000.00
01/51/99	5100.00											5100.00
01/52/99	5200.00											5200.00
01/53/99	5300.00											5300.00
01/54/99	5400.00											5400.00
01/55/99	5500.00											5500.00
01/56/99	5600.00											5600.00
01/57/99	5700.00											5700.00
01/58/99	5800.00											5800.00
01/59/99	5900.00											5900.00
01/60/99	6000.00											6000.00
01/61/99	6100.00											6100.00
01/62/99	6200.00											6200.00
01/63/99	6300.00											6300.00
01/64/99	6400.00											6400.00
01/65/99	6500.00											6500.00
01/66/99	6600.00											6600.00
01/67/99	6700.00											6700.00
01/68/99	6800.00											6800.00
01/69/99	6900.00											6900.00
01/70/99	7000.00											7000.00
01/71/99	7100.00											7100.00
01/72/99	7200.00											7200.00
01/73/99	7300.00											7300.00
01/74/99	7400.00											7400.00
01/75/99	7500.00											7500.00
01/76/99	7600.00											7600.00
01/77/99	7700.00											7700.00
01/78/99	7800.00											7800.00
01/79/99	7900.00											7900.00
01/80/99	8000.00											8000.00
01/81/99	8100.00											8100.00
01/82/99	8200.00											8200.00
01/83/99	8300.00											8300.00
01/84/99	8400.00											8400.00
01/85/99	8500.00											8500.00
01/86/99	8600.00											8600.00
01/87/99	8700.00											8700.00
01/88/99	8800.00											8800.00
01/89/99	8900.00											8900.00
01/90/99	9000.00											9000.00
01/91/99	9100.00											9100.00
01/92/99	9200.00											9200.00
01/93/99	9300.00											9300.00
01/94/99	9400.00											9400.00
01/95/99	9500.00											9500.00
01/96/99	9600.00											9600.00
01/97/99	9700.00											9700.00
01/98/99	9800.00											9800.00
01/99/99	9900.00											9900.00
02/01/00	10000.00											10000.00



M.T.N. Trek Product Catalog

#817 All-Weather Tent

This is dummy copy, not intended to be read. It is only here to give you an idea of the space that the real copy will occupy. This is dummy copy, not intended to be read. It is only here to give you an idea of the space that the real copy will occupy. This is dummy copy, not to be read.

\$175.00

#887 Down-Filled Jacket

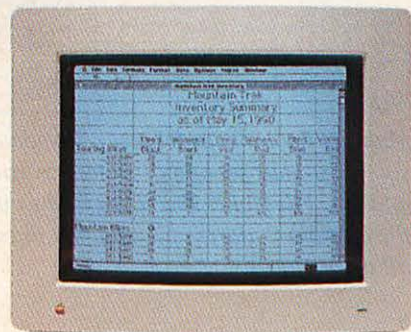
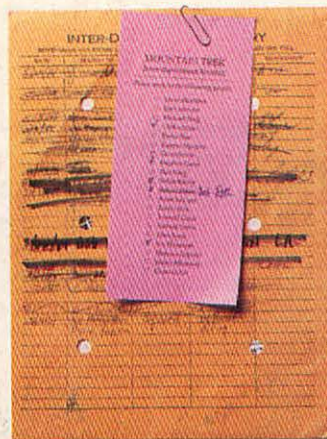
This is dummy copy, not intended to be read. It is only here to give you an idea of the space that the real copy will occupy. This is dummy copy, not intended to be read. It is only here to give you an idea of the space that the real copy will occupy. This is dummy copy, not to be read.

\$250.00

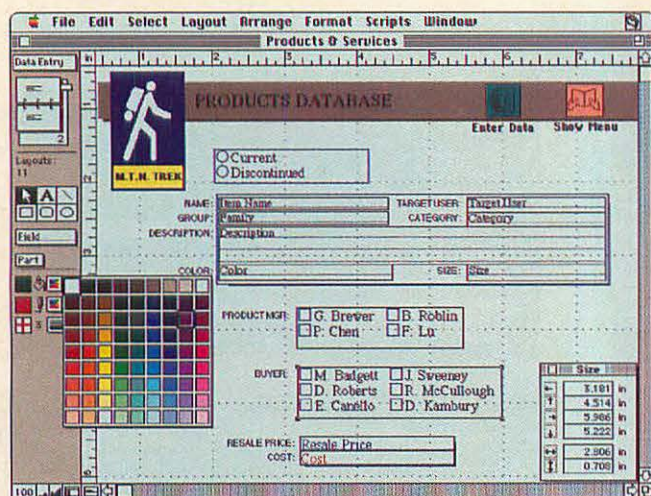
#271 Hiking Boots

This is dummy copy, not intended to be read. It is only here to give you an idea of the space that the real copy will occupy. This is dummy copy, not intended to be read. It is only here to give you an idea of the space that the real copy will occupy. This is dummy copy, not to be read.

\$97.00



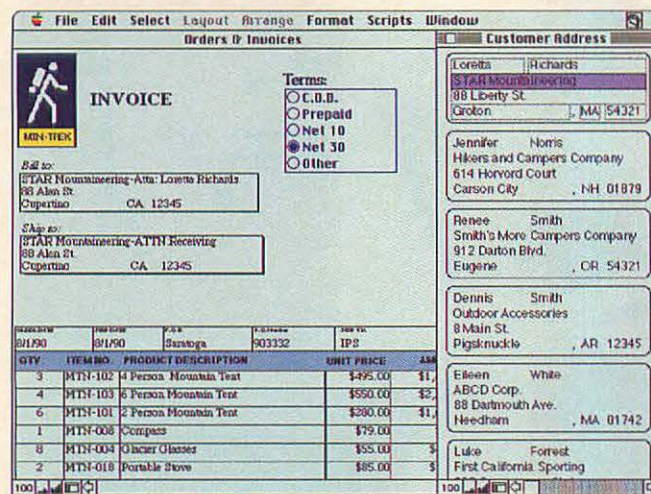
But you can choose how to manage it.



FileMaker® Pro software includes sophisticated drawing tools so you can create layouts in any form you choose. Pop-up menus, radio buttons and checkboxes make entering data fast and accurate. And a full palette of colors helps people vividly see your thoughts.



FileMaker Pro lets you automate repetitive tasks with "buttons." It's easy. Simply select any object or graphic on the screen and a "button" is born. Buttons can invoke commands, trigger scripts, and switch layouts—all without plodding through a programming language.




Multiple-file lookups let you relate data. For example, when you want your monthly invoices to each show customer address, FileMaker Pro looks at the customer name, searches the customer address file and fills in each address for you—*all automatically.*



You can share files on a network and control exactly who sees what on their screen. For example, if you want to share the hire date of an employee, but not his salary, simply check the appropriate boxes in the access dialog box. The hire date field will be shown. The salary field will not. Security is this simple.


And publish it.



M.T.N. Trek


Sales Report by Season

Fall




Camping	\$2,765.00
Clothes	\$4,842.60
Sports Equipment	\$5,690.00
Mountain Bikes	\$7,740.88
Season Total	\$21,038.48

Spring




Camping	\$369.90
Clothes	\$5,351.76
Sports Equipment	\$39,083.31
Mountain Bikes	\$73,543.00
Season Total	\$118,347.97

Summer



Camping	\$95.00
Clothes	\$10,339.12
Sports Equipment	\$950.00
Mountain Bikes	\$1,029.94
Season Total	\$12,414.06

Winter



Camping	\$7,320.00
Clothes	\$2,720.00
Sports Equipment	\$5,015.36
Mountain Bikes	\$1,529.10
Season Total	\$16,584.46

Total Sales

\$168,384.97

Camping	\$10,549.90	21%
Clothes	\$23,253.48	33%
Sports Equipment	\$50,738.67	22%
Mountain Bikes	\$83,842.92	24%

Your job demands information, not data. FileMaker Pro includes a range of calculation functions: It turns raw data into business information. And with MacDraw®-based tools built in, you can display this information on the page any way you want.



If collecting data were all it took to get promoted, we'd all be president.

Unfortunately, the world demands you actually do something with your data. And then present it in a compelling and useful way.

Which is where FileMaker Pro comes in. It's the #1 database manager for the Macintosh, stuffed with new power.

There's powerful scripting with user-definable buttons for automating tasks. Multiple-file lookups for relating data. Network access with field-by-field security for workgroups. And flexible report generation, including color and database publishing tools.


Yet, FileMaker Pro does all this without making you learn a complex programming language.

If it sounds simple, it is.

You'll find a few surprises, however. All of them pleasant.

As you use FileMaker Pro you will find more and more things to do with it. This "revealed power" is

M.T.N. Trek Product Catalog

	#721 Hiking Boots These custom-made leather and canvas hiking boots are both comfortable and rugged. The high-rise design provides good ankle support and helps prevent injuries. The tread grips both loose soil and ice. Sizes and half sizes from 9 through 13.	\$129.99
	Lifetime Compass This classy compass is a great tool for knowing which way you're going! The little magic needle always points toward North and the wrist strap makes it easy to carry. The compact plastic case protects the innards.	#598 \$79.99
	#477 All-Weather Tent Made of durable nylon and advanced water-repellent cotton blends, the MTN Tent is a perennial best-seller. Comes with tie-downs and wind flaps. A custom-fit padded floor mat is available at extra cost.	\$289.99

See Page 32 for Ordering Information

30

All that data you've got stored can be published in eye-catching color, and in any format you can imagine. You can publish directories, forms and catalogs with precision and ease. It's almost like having a database publisher built in.

what makes FileMaker users FileMaker fanatics.

What's more, you will experience the seamless way that FileMaker Pro fits with other Claris® software. The graphic and text tools work the same as they do in our other products—so you spend more time on business and less time remembering commands. There's also XTND, a Claris invention that lets you easily exchange text and graphics with other software and computers without loss of formatting. All this raises Macintosh productivity to a new level.

But why not see for yourself? Simply stop by an authorized Claris dealer and ask to see FileMaker Pro. It's the start of a better way to manage the data you have to manage.

FileMaker Pro.
The #1 database manager for the Macintosh.

CLARIS®

©1990 Claris Corporation. All rights reserved. Claris, FileMaker and MacDraw are registered trademarks of Claris Corporation. Macintosh is a registered trademark of Apple Computer, Inc. For upgrades and more information, call 1-800-544-8554, ext. 41. In Canada, call 1-800-668-8948.

Circle 496 on reader service card

Develop your ideas in Digital Darkroom.

1 A classic arch becomes the anchor for this surreal composition. After eliminating unwanted areas, a stair-step design is added.

2 After being cut from its background, a skyscraper is added. A false bottom is created with simple retouching.

3 With the help of automated paste controls that replace tedious pixel editing, the waves wrap around the arch.

4 Using brightness and contrast controls, dramatic clouds are salvaged from an underexposed original and then pasted into the background.

5 Finally, the children step out of an otherwise ordinary photo — with the help of the Magic Wand automatic selection tool — to add the key dramatic element to the composition.

Now bundled with Abaton and Microtek grayscale scanners!

Imagine a computerized darkroom...in your Macintosh.[®] Software that gives you more control over grayscale images than even the most skilled photographer. That's Digital Darkroom.[™]

Unique "intelligent" tools eliminate much of the work in creating dramatic compositions, whether you're a beginner or a professional. You can automatically select objects using the Magic Wand, or blend one image into another with simple slider controls. You can freely slant, stretch or rotate your image to get precisely what you want.

For detailed retouching, you have brushes and filters that blur, sharpen, smudge or create complex textures and other special effects. You can even outline shapes in your images automatically with AutoTrace.[™]

Circle 105 on reader service card

And when it's just right on-screen, the exclusive Advanced Halftone printing option will give you the smoothest grays and sharpest detail you've ever seen on a 300 dpi laser printer — even on non-PostScript[®] language printers.

From simple retouching, to the wildest flights of imagination, develop your ideas — in Digital Darkroom.

Suggested retail price: \$395.

System requirements:
Macintosh Plus, SE or Macintosh II

Silicon Beach Software, Inc.
9770 Carroll Center Road, Suite J
San Diego, Ca 92126 • (619) 695-6956

Digital Darkroom and AutoTrace are trademarks of Silicon Beach Software, Inc. Macintosh is a registered trademark of Apple Computer, Inc. PostScript is a registered trademark of Adobe Systems Inc.



SILICON BEACH
SOFTWARE

See Us at MacWorld Expo Booth #5112



Code and Dagger

HAVE YOU FORGOTTEN ABOUT THE nuPROMETHEUS LEAGUE? THE FBI HASN'T.

O

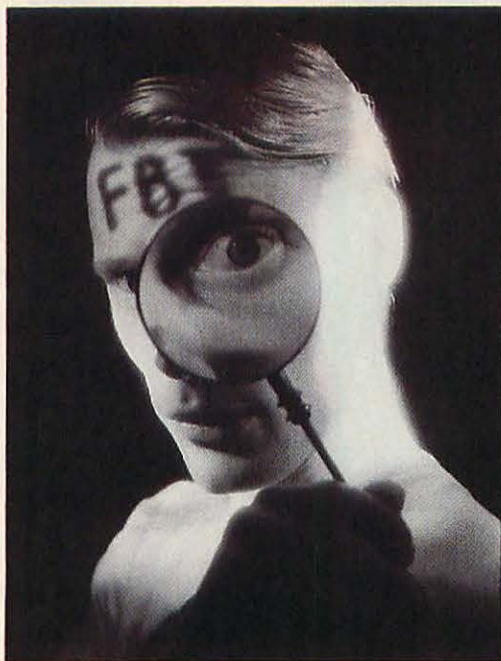
BY STEVEN LEVY

One afternoon not too long ago, I was sitting in my office, at peace with the world, feeling like a solid citizen, when I received the first of two rather unsettling phone calls from Agent Joe Fallon of the Queens, New York, field office

of the Federal Bureau of Investigation. Agent Fallon began by insisting that he had spoken to me six months previously and that I had referred him to my lawyer. Now this is the sort of thing one tends to remember. But hey, I figured, maybe it was one of those amnesia things. So I asked him for my lawyer's name, hoping that might jog my memory.

Agent Fallon suddenly retreated from his assertion that we had previously spoken. Maybe, he offered, it was some other Steven Levy. But, by the way, could I tell him if I had any knowledge of the nuPrometheus group? Or was I in possession of any material stolen from Apple Computer? Or did I know of anyone who was?

Now of course I knew about nuPrometheus. After all, it's part of my job to keep track of the bizarre things that happen around Apple Computer, a place that would keep Ripley supplied with items for a month of Sundays. This particular outrage had occurred in spring, 1989. Unmarked computer disks were sent to various publications, including *MacWeek*, *Computer Currents*, and *InfoWorld*,



as well as to software entrepreneur Mitch Kapor and a scientist at MIT's Artificial Intelligence Lab. They were accompanied by a letter signed by "The nuPrometheus League (Software Artists for Information Dissemina-

tion)." The letter contained some blather about the league's intention of "seeing the genius of a few Apple employees benefit the entire world, not just dissipated by Apple Corporate through litigation and ill will." When these recipients opened the disk and saw that it indeed appeared to be Macintosh source code (it turned out to be Apple's Color Quick-Draw routines), they called Apple and sent the disks in. The theft quite understandably bent some minds in the boardrooms of Cupertino, since Apple's apparent corporate function is to jealously guard and shamelessly cash in on the innovations it made in the early eighties, most of them embodied in Mac source code.

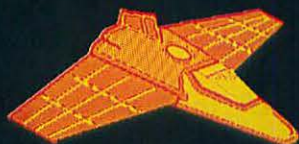
Not that I knew anything about who did it. I explained to Agent Fallon that I was merely a journalist and even spelled out the name of this magazine for him. (It seemed news to him that there were magazines for this sort of thing.) All I knew

of the hard facts of nuPrometheus were things I read in the papers. His response was to repeat his questions to me, almost as if reading off a list. I wondered if this was a failure of (continues)

JEFFREY NEWBURY

NEW FROM THE PUBLISHERS OF CRYSTAL QUEST!

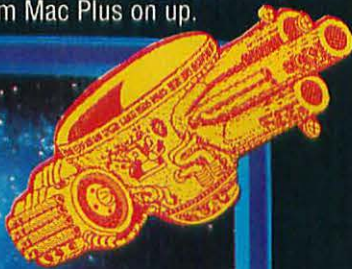
MISSION STARLIGHT™



Mission Starlight combines three different kinds of gameplay. ROLL around the evil Aalgezys as they try to destroy you, SWOOP over planet surfaces to pilot your star fighter around more creatures and ZOOM down the last tunnel for the final battle. Watch out for the cannons! The color 3D graphics are stunning, the game is fun and all kids love it! What more could you ask for? Runs on all Macs from the Mac Plus on up. Quitting Mission Starlight is mission impossible!

SKY SHADOW™

Crystal Quest's author, Patrick Buckland, has done it again! He's written a shoot-everything-that-moves game, but don't nuke your own city and watch out for the little tents with red crosses on them and don't forget to pick up the goodies in the sky like the invulnerability icon. Then land at home base to heal, get bonus points and load more bombs. The graphics, silly sounds and fast-paced gameplay combine to form one very addicting game. In color, for you lucky folks who have it! Runs on all Macs, from Mac Plus on up.



TO ORDER, CALL (800)359-4920 TODAY!

Casady & Greene, Inc.™

Software For Business & Pleasure

P.O. BOX 223779 · CARMEL, CA 93922 · 408-624-8716

Circle 137 on reader service card

communication. I repeated my non-involvement, and I thought that was the end of it.

A scant two weeks later, however, Agent Fallon was back on the phone, wanting to know if I was ready to share further information. Maybe he figured I had cracked in the interim. In any case, I had no news. But I did have some questions for *him*. Like why he was calling me. "Somehow your name came up," he said, not fully satisfying my curiosity on that matter. Well then, why was the FBI so active now in pursuing the case, a year after the theft? According to Agent Fallon, this was a significant case of ITSP—Interstate Transportation of Stolen Property—and the FBI was extremely interested.

"I can equate this with a national secret," he said with some urgency. If a spy were to come by this code, Fallon explained, he might use it to *break into* the Apple Macintosh computer and steal the secrets within it. Well, I countered humbly, it doesn't exactly work that way. And I proceeded to explain a few things about how personal computers worked.

By this time I thought Agent Fallon and I were getting to be buddies. Unhappily, this camaraderie was cut short when he asked if I would supply him with my date of birth—I had the feeling that it wasn't to send me a greeting card. It was, he explained, to see if I had a criminal record.

Like I say, these were unsettling phone calls.

Did Efrem Zimbalist, Jr., Start This Way?

In days to come I learned that I was far from the only unlikely source contacted by the bureau. It seems that around the country many others had had similar experiences. Among these was Mitch Kapor, one of the recipients of the code. He was interviewed a year ago. At that time, he was shown a list of names and asked if any of them were hackers. The session "had a surrealistic quality and was profoundly disturbing," Kapor recalls. "It seemed obvious to me they didn't have a clear sense of the technology—there was such a lack of understanding that the effort to investigate wouldn't bear fruit. They were lost in cyberspace."

(continues)

☒ GENERAL LEDGER ☒ ACCOUNTS RECEIVABLE ☒ ACCOUNTS PAYABLE ☒ PAYROLL ☒ INVENTORY

The Fully Integrated, Easy to Use Accounting System for All the Reasons You Started Using the Mac in the First Place.

Accountant, Inc. Professional is the first truly integrated accounting system designed specifically to exploit the strengths of the Macintosh. Not just a watered down version of a DOS package, Accountant, Inc. Professional puts the most comprehensive set of accounting tools ever assembled for the Macintosh right at your fingertips. What's more, you don't need to know anything about accounting to unleash its full potential, all functions are handled from the familiar interface. All posting, reporting and double-entry bookkeeping functions are done for you — automatically.

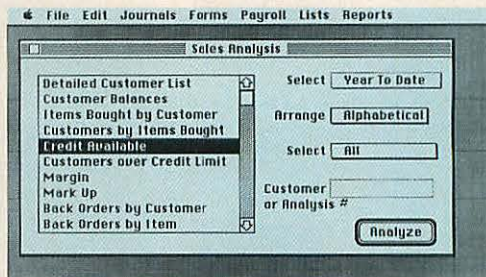
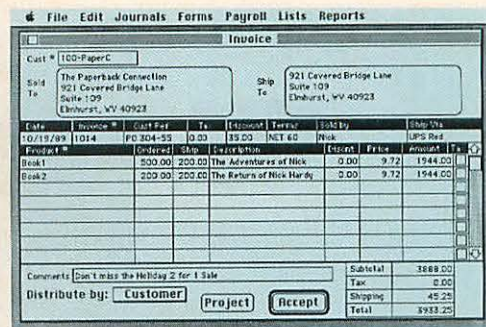
Powerful Accounting for Innovative People.

Ideal for emerging businesses, Accountant, Inc. Professional includes General Ledger, Accounts Receivable/Payable, Payroll, Inventory Management, Job Costing and Project Management modules all seamlessly integrated. You can instantly produce detailed reports that quickly bring the big picture into sharp focus. Run an income statement or balance sheet anytime, check how much is owed to you, who bought what last month or over 100 other critical financial analyses. Accountant, Inc. Professional isn't just accounting — it's powerful financial management.

Fast Data Entry.

Since Accountant, Inc. Professional handles all posting chores, data entry is fast and simple. The powerful system beneath the sleek interface knows how to appropriately

**More Control,
More Analysis,
More Power
and Flexibility.**



post the information you've entered — that saves you hundreds of hours of bookkeeping time.

It Works the Way You Work.

Flexibility across the board. Accountant, Inc. Professional is perfectly suited for service companies, professionals, manufacturers — virtually any type of business. This superior flexibility extends to every aspect of its functionality, so it adapts to your way of doing things instead of the other way around.

Fast, Easy Payroll and Extensive Reporting.

The program has FICA, FUTA, SUTA and Disability deductions built in. You can define an additional 50 (ranging from Dental Plans to 401K's) as needed. Pay periods can be defined as weekly, bi-weekly, semi-monthly, monthly.

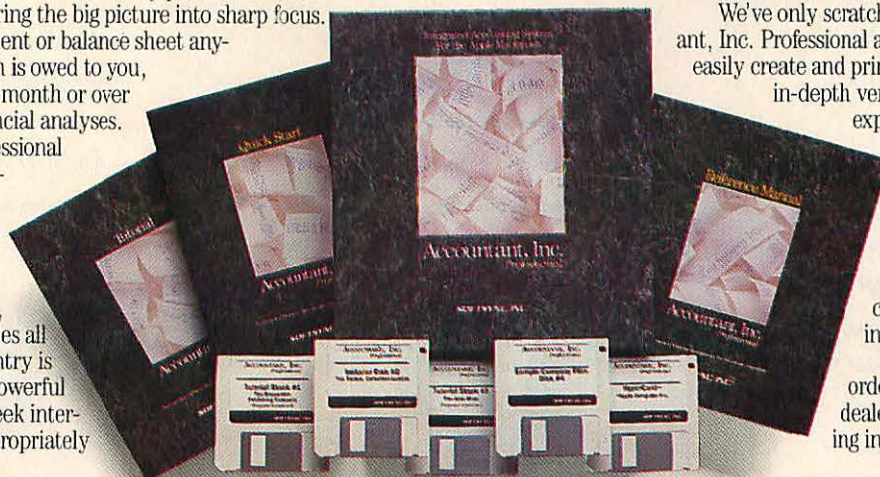
Create over 100 reports and analyses, including Income Statements, Balance Sheet, agings, customer statements and configurable reports.

Amazing Performance, Modest Pricing.

We've only scratched the surface. Accountant, Inc. Professional allows you to quickly and easily create and print your own forms, perform in-depth vendor and customer analysis, export reports to word processors, databases and spreadsheets and handle tax-related issues.

At just \$595, Accountant, Inc. Professional is the most intelligent choice in Macintosh accounting, and we guarantee it.

Call (800) 933-2537 to order, or contact your local dealer — and put your accounting in the hands of a pro.



Accountant, Inc. Professional

Business and Financial Management for Macintosh Computers



Generation X Color 242780



Control Systems ARTIST Mac10



Truevision NuVista® 1M, 2M, 4M



Micron Tech Xceed NB6-48



RasterOps® ColorBoard 224



RasterOps® ColorBoard 264



PCPC CGCII/32



Micron Tech Xceed SE/3010-78



Generation X VII



Truevision, HR 2M, 4M



Apple Macintosh II Video Card



PCPC CGCII/3

All major

Not an unusual claim for a 4-star restaurant. But for a monitor, it's quite a story. With NEC's multiple-frequency technology, our monitors can accept all kinds of video cards for applications ranging from standard desktop software to large-screen graphics design. And your NEC dealer has several different Macintosh-compatible MultiSync® monitors he'd be glad to show you. In fact, he might even take plastic.

MultiSync GS2A Superior gray-scale monitor, 14" flat-surface screen. Supports the Macintosh II video card and compatibles. Ideal for desktop publishing.



MacSync™ Series Designed exclusively for Macintosh II video card and compatibles. Available in both non-glare and new high-contrast 14" screens





E-Machines DoubleColor™



Micron Tech Xceed SE/306-48



RasterOps® ColorBoard 108+



Relaz Tech View II 8-bit 13"



Generation X V/30 X



Relaz Tech View II 8-bit 19"



SuperMac ColorCard/24



RasterOps® ColorCard 232



Micron Tech Xceed NB10-78



Generation X V/30 A



SuperMac Spectrum/8 Series III



SuperMac Spectrum/24 Series III

cards accepted.

MultiSync 3D Supports Macintosh II card and compatibles. Advanced microprocessor digital controls. 14" screen. Perfect for multimedia applications.



MultiSync 4D Resolution from standard Macintosh II card, 800 x 600, up to 1024 x 768. Choose your own dpi on a 16" screen. Microprocessor digital controls.



MultiSync 5D Resolution from Mac II card and compatibles up to 1280 x 1024 on a 20" screen for graphics design. Microprocessor digital controls.



AFTER DARK 2

THE ULTIMATE SCREEN SAVER

Now Over 30 Displays and SOUND!

HEAR the thunder, exploding stars and screen-munching worms!

Create your own displays with logos and other graphics!

blup-blub

Appearing now at a dealer near you

FEATURING

- Optional Random Display
- Simultaneous Displays
- Improved Password Protection
- Programmer's Instructions

STILL only \$39.95
Call for upgrade info.
(415) 540-5535

tic tic tic

BERKELEY
SYSTEMS

Circle 381 on reader service card.

More recently, around the time I was interviewed, John Perry Barlow, who writes about technology when he is not writing lyrics for the Grateful Dead, received a visit at his Pinedale, Wyoming, home from one Special Agent Baxter. "Agent Baxter didn't know a ROM chip from a Vise-grip when he arrived," wrote Barlow in an account he posted on the online service called the WELL, "so much of that time was spent trying to educate him on the nature of the thing which had been stolen. Or whether *stolen* was the right term for what had happened to it. After I showed him some actual source code, gave a demonstration of E-mail in action, and downloaded a file from the WELL, he took to rubbing his face with both hands, peering up over his fingertips and saying, 'It sure is something, isn't it? My eight-year-old knows more about these things than I do.'"

Barlow also reports that Agent Baxter told him some startling information—rather, misinformation—about the Hacker's Conference, a yearly meeting of wizard-level computer programmers instituted after the publication of my book *Hackers* in 1984. The FBI seemed convinced that this annual conclave provided a key to computer terrorism. It was not merely a spirited gathering of technology creators exchanging new ideas, as we thought, but, as Barlow quoted Baxter, a "gathering of computer outlaws with likely connections to, and almost certainly sympathy with, the nuPrometheus League." (Barlow also notes that Baxter consistently referred to the group as the New Prosthesis League.) In addition, the agent asserted that known hacker conference attendee John Draper (a notorious former phone phreaker known as Captain Crunch) was the CEO of the computer firm and Star Wars contractor Autodesk. (This would be news to Autodesk's John Walker, whose firm specializes in CAD software and not deadly laser beams. However, Walker, along with other potential shady characters like Nolan Bushnell, Stephen Wolfram, and science fiction writer Vernor Vinge, was at the most recent Hacker's Conference.)

It gets wilder. A former Apple programmer named Grady Ward says he

was told that the stolen code was now filtering back to Communist enemies of America through the Toshiba electronics company and also through John Draper. (For the record, there has been no evidence released linking this company or that man to the crime.) "It was an incredible story," says Ward. "It wouldn't even make a good novel. They said Draper was going to release the code and tip the international balance of power."

The Nature of the Crime

Though Apple spokesperson Chris Escher says that the company is cooperating with the FBI (and that's literally all he will say about the case), apparently the cooperation does not extend to educating the FBI on the nature of what was stolen or even clueing the poor floundering agents in on the most rudimentary facts about personal computers.

Part of the problem seems to lie in the FBI's attitude toward the case. Agent Steven Cook, while refusing to comment directly on the progress of the case, put it succinctly: "This isn't a technology investigation—it's interstate theft."

That may be the legal charge, but the theft of source code involved in nuPrometheus is quite a different matter from hijacking a truck or robbing a bank. Software is a much trickier object than swag or money—it can move in elusive ways, and therefore access to protected software is a technically complicated matter. And the problem of the criminal's motive requires an even deeper understanding. In order to understand and ultimately apprehend the perpetrator, one must realize that this particular crime seems motivated not by greed or maliciousness, but by a peculiar attitude toward technology in general and the role of Apple Computer in particular. For instance, anyone familiar with the history of John Draper would realize that the nuPrometheus crime has nothing in common with Captain Crunch's phone phreaking. One has to feel some sympathy for the agents here—it's a terrible burden to have to solve this rather bizarre ideological crime without being steeped in the lore of Silicon Valley.

(continues)

EVERY YEAR, WE GIVE THE INDUSTRY A LESSON IN PRICE AND PERFORMANCE.



CLASS IS NOW IN SESSION. Introducing the \$2399 BLP II.

Two years ago, they called our Business LaserPrinter™ “The future of PostScript.” Last year, they gave our PLP™ II the MacUser Editors’ Choice Award. But this time, we’re really giving them something to study. Because now, we’ve done what was considered impossible. We’ve produced a printer that dramatically outperforms the Apple® LaserWriter® IINT, at half the cost: the \$2399 Business LaserPrinter II (BLP™ II).

PostScript For Less.

This is the printer you’ve always wanted, at a price you never thought you’d see. With true Adobe™ PostScript and built-in AppleTalk®, you and everyone else on your Macintosh® network can immediately start producing the highest quality, 300 dots-per-inch (dpi) graphics and text using your favorite software. You even get the same 35 fonts as you get with the Apple LaserWriter. But now, the real lesson begins.

Better At Any Price.

Even if money were no object, the BLP II would still be the printer of choice. It has 2 megabytes of RAM, user expandable to 4, plus a high-speed processor so it can image your document almost twice as fast as the IINT. And unlike the competition, the BLP II’s SCSI port boosts performance and provides access to unlimited on-line fonts. Want more? How about a small footprint and silent sleep mode. Edge-to-edge printing. User-friendly LCD front panel display, cost-saving toner recycling system, and our advanced QuickEnvelope™ software that makes printing envelopes a snap. Still not enough?

The Fast Track: BLP IIS.

Maybe you have a large network, with a heavy print load. A network you thought required the speed, power and price tag of a LaserWriter IINTX. Well, think again.

Because the BLP IIS gives you performance rivaling the IINTX at less than half the cost: an 8-page-per-minute printer for just \$2899. Whether you choose the BLP II or the BLP IIS, you get compatibility not only with Macintosh, but with IBM® and compatibles, using PostScript or the optional LaserJet II emulation. And you get it fast.

Dealer or Direct: Your Choice.

Just call us toll-free. We’ll give you the name of your nearest GCC Technologies dealer. Or order direct from us, with a 30-day money-back guarantee and \$9 overnight delivery. The \$2399 BLP II and \$2899 BLP IIS. What else can we say, except “class dismissed.”

800-422-7777.



**GCC
TECHNOLOGIES**

Peripherals With Vision.™

GCC dealers are independent businesses and as such they may offer different prices, policies, and service arrangements. In Canada call 800 263-1405. © 1990 GCC Technologies, Inc.

Circle 11 on reader service card

AD#02009B

The right typeface can have impact – the wrong one can be a disaster. But how do you know what is your type? Don't worry about it. With Fontographer®, The Art Importer®, and Metamorphosis®, you can easily create and edit PostScript® fonts. And make them *all* your type.

Make it your type.

Fontographer (fōn-tōg' rə-fūr) *n.* 1. The Macintosh® industry-standard for PostScript type design. 2. Draw from scratch, begin with a scanned image, or modify an existing font — it's easy to design your type. 3. ATM-compatible, too!

The Art Importer (thē ārt 'īm-pōr'tər) *n.* 1. Create high resolution, full color PostScript fonts from your existing Macintosh artwork. 2. Produce typefaces from EPS and PICT formats. 3. Make special fonts full of company logos, symbols, signatures, and graphics.

Metamorphosis (mēt-ə-mōr' fə-sīs) *n.* 1. A unique utility for converting your PostScript fonts into outline formats. 2. Those outlines can then be edited in any PostScript illustration program, like Aldus® FreeHand™ or Adobe Illustrator®, or even Fontographer. 3. Since Metamorphosis can convert any PostScript font into outlines, consider the exciting things you could do to enhance your type.

So, what do you say?
Are you ready to make
it *your* type?

Suggested Retail Prices: Fontographer — \$ 495 The Art Importer — \$ 179 Metamorphosis — \$ 295

Circle 35 on reader service card

ALTSYS
Altsys Corporation
269 Pennell Road
Redwood City, CA 94060
(415) 680-2060

Order
Toll-Free
Now

FRESH, CONCENTRATED COLOR IMAGES FROM KODAK



Original Image



Compressed 38X

New KODAK COLORSQUEEZE™ Image Compression Software saves memory, minutes and money for Macintosh II computer users.

Now compress 24-bit PICT and TIFF files by up to 50 times or more (depending on the amount of detail in the image) and retain remarkable image quality.

KODAK COLORSQUEEZE Software is fast—compress or decompress a 768K image on a standard Macintosh IIcx computer in less than forty seconds. Plus, you can quickly view multiple images with our unique “thumbnail” files. Conforms to the emerging JPEG standard.

Use your VISA or MasterCard to order now for just \$179. Call 1-800-233-1650, Ext. D (in NYS: 1-800-233-1647, Ext. D) 8-5 EST.



Circle 377 on reader service card.

© Eastman Kodak Company, 1990

J'Accuse

Unfortunately, if the investigation is poorly handled, innocent people may suffer. So far the FBI has directly accused, though filed no charges against, at least three men. There seems to be no hard evidence against any of them. One was Chuck Farnham, the kind of guy Claude Rains might consider one of the “usual suspects.” Farnham is a gadfly who admittedly has handled confidential Apple information on occasion; he has even been known to inhabit garbage dumpsters in search of forbidden knowledge. “Someone in Los Angeles gave the FBI the names of three possible suspects,” Farnham told me, “and I was two of them.” But Farnham claims that he was not involved in nuPrometheus and further claims that at times during the previous year he acted as an unofficial consultant to the company on security matters. (No one at Apple would confirm this.)

The Ward File

The second potential suspect, who also denies involvement, was the aforementioned former Apple employee Grady Ward. According to Ward's account, one morning FBI agent Steven Cook visited the 39-year-old engineer and said, “We know you did it.” The agent had a subpoena for Ward's fingerprints.

Why did they consider Ward a suspect? Because, they told him, he was judged the likeliest of five people at Apple who had requested access to the ROM code in the specific release that fell into nuPrometheus hands. The criteria for narrowing it to him? He had since left Apple, he had attended a progressive liberal-arts college, and he once formed an intellectual society called Cincinnatus, thus betraying the same fondness for antiquity shown by the name nuPrometheus.

Did he in fact sign out the source code? “It was true,” he says. “I checked the code out and shared it with our group. That was part of our job—anyone in [my manager's] organization had access and didn't need permission to see it.” How many people were in his group? “Hundreds,” he says. “The source code would go [throughout Apple] on the Internet network. (continues)

THE ULTRADRIVE 50R REMOVABLE HARD DISK. IT LEAVES THE COMPETITION IN THE DUST.



And therein lies the problem. Dust. Which has caused previous removable hard disks to be encumbered with reliability problems, such as file corruption, head crashes, and most importantly, complete loss of valuable data. We know this because we've spent the past two years in search of a removable hard disk that met our uncompromising standards of reliability.

Presenting the UltraDrive™ 50R from GCC Technologies™, the first removable hard disk reliable enough to be called an UltraDrive.

Airtight Technology.

The reason for this great leap in reliability is UltraDrive 50R's airtight design.

UltraDrive 50R is based on the latest breakthrough technology from Ricoh®, incorporating a contamination-free cartridge. Unlike the competition, these cartridges are manufactured in a "clean-room" environment, and are sealed to prevent interference from dust particles

and everyday air contamination. No dust. No contamination. And no loss of data.

More Storage Options.

For people who work with a multitude of files, or large files such as color or scanned images, having a removable hard disk can be invaluable.

Instead of buying a high-capacity hard disk, you can now purchase an UltraDrive 50R and simply add extra cartridges as your storage needs increase.

Removable storage also provides you with the peace of mind of greater security. Once you've finished working on your files for the day, you can store them away in a vault, a locked desk, or filing cabinet.

And if you'd rather take your files with you, just toss the cartridge in a briefcase, and your data is ready to travel.

Value-Added Software.

Along with reliability, security, and portability, UltraDrive 50R also gives you plenty of software.

In fact, you get the same software that comes with our UltraDrive S Series of hard disks. You get SUM™ II, the award-winning disk utilities package from Symantec™. You also get GCC's own spooling utility, QuickSpool™ II, as well as QuickEnvelope™, which takes the hassle out of printing envelopes.

Dealer or Direct: Your Choice.

UltraDrive 50R is just as easy to order. Simply call us toll-free and we'll give you the name of your nearest GCC Technologies dealer. Or order direct from us, with a 30-day money-back guarantee and \$9 overnight delivery.

The \$1299 UltraDrive 50R. Reliability, security, portability, and software. It's a clean sweep.

800-422-7777.



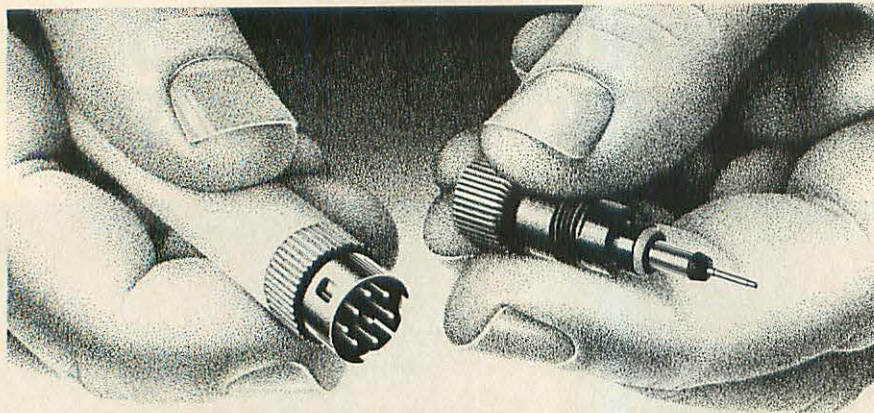
**GCC
TECHNOLOGIES**

Peripherals With Vision.™

Circle 119 on reader service card

GCC dealers are independent businesses and as such they may offer different prices, policies, and service arrangements. In Canada call 800 263-1405. © 1990 GCC Technologies, Inc.

AD#02009C



PowerDraw[®] *The Secret Is Out.*

And so is PowerDraw Version 3.0. Get to know the most powerful CAD program ever developed for the Macintosh. Intuitive. Fast. Elegant.



By Engineered Software

Call Engineered Software for complete information or the dealer nearest you. 1-919-299-4843.

Circle 12 on reader service card.

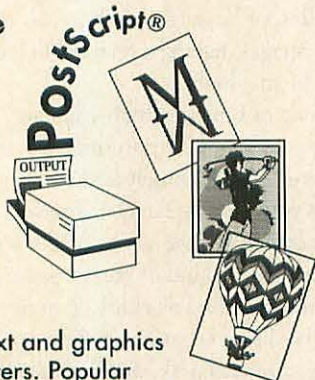
DPT #696



The smooth performer

PostScript[®]
on almost any printer
No Hardware Required
Supports Adobe[®] Type

\$145



TScript allows you to output PostScript text and graphics to a variety of non-PostScript based printers. Popular programs supported by TScript include Illustrator[®], Freehand[®], PageMaker[®] and QuarkXPress[®]. TScript supports HP LaserJet series, DeskJet, DeskWriter, GCC PLP, LaserWriter SC, ImageWriter, Canon LBP. Previews PostScript files to Mac screen. Runs on MacPlus or higher. Options available for color printers and slide makers. 474 Commonwealth Ave., Boston, MA 02215. Fax 617-734-3974.

30 DAY MONEY BACK GUARANTEE

TScript[®] is a registered trademark of TeleTypesetting Co., PostScript is a registered trademark of Adobe Systems, Inc. All other products and names are registered trademarks of their respective manufacturers. TScript was formerly called MacRIP.



TeleTypesetting

617-734-9700

See us at Boston
MacWorld #468

Circle 476 on reader service card.

People could browse through it. You could collect pieces, like trading stamps, and eventually get the entire operating system."

Another former Apple employee concurs that it was no trick for any Apple engineer to copy the so-called crown jewels. And why not? Only by knowing what the code was could people improve upon it. "It's like love," says Grady Ward. "The more you copy it the more you have." (Precisely the sort of tricky technological fact that the FBI is unlikely to grasp.)

In any case, Ward provided the fingerprints as required by law, and he hasn't heard from the FBI since.

Member of the Party

The third person directly accused was Walter Horat, a programmer who says he was contracted to do a job at Apple soon after the nuPrometheus mailing. "Anyway, I had no access to engineering documents," he says, denying any involvement in the crime. This past April the FBI came to his cubicle at Apple to interview him (he was out sick) and then to his house two days later. They told him there was a witness who overheard him boasting at a party that he was involved in the case. Asked to take a polygraph test, Horat consulted a lawyer and declined the offer. Subsequently, he was fired from Apple "with no reason given," he says. Only afterward, reconstructing his conversations with others at the party, did he recall discussing the nuPrometheus case—but, he insists, only speculating about it, just as thousands of people do in gossip-driven Silicon Valley.

Sorcerer's Apprentices

Questions persist in this case, and almost all of them are more perplexing than the identity of the criminal. First is the question of why the FBI has decided that chasing down this particular lawbreaker is more important than, say, using its resources to pursue the estimated thousands of white-collar thieves who sacked the savings-and-loan institutes and wound up costing taxpayers perhaps a trillion dollars. After all, Apple has managed to stay in business after the theft of the code and, despite the league's (continues)

WRITEIMPACT. THE FIRST DOT-MATRIX PRINTER WITH A WORK ETHIC TO MATCH YOUR OWN.



Finally there's a Macintosh® printer that works as hard as you do to stay ahead of the game. With the WriteImpact™ from GCC Technologies™, you can focus more on your business and less on your paper work. That's because WriteImpact is designed to handle the tough work loads associated with printing payroll checks, labels, large client mailings, and multi-part forms such as invoices and statements.

Paper Versatility.

WriteImpact is engineered with paper handling options that provide you with the versatility and flexibility to make your work day a little easier.

For starters, WriteImpact can print on assorted paper sizes and weights, which makes printing checks and multi-part forms hassle-free. You can choose to print your documents in push or pull tractor-feed mode, or in friction-feed for single sheets and envelopes.

And, thanks to automatic paper loading and parking, you can save time while printing your envelopes and single

sheets without ever having to remove the tractor-feed paper. There's even a paper tear feature with automatic paper repositioning.

Need to print a large mailing on your company's letterhead? With WriteImpact's optional automatic sheet feeder, you just load the paper into the feeder and the printer does the rest of the work.

Letter Quality. Outline Fonts.

Compromise print quality for versatility? Never! Your work ethic wouldn't allow it.

Now, with WriteImpact you don't have to, because its 24-pin print head produces letter-quality output at 360 horizontal x 180 vertical dots per inch (dpi).

You also get 22 high-quality Bitstream® outline fonts, which can be rotated to any angle, shaped, and scaled in point sizes ranging from 2 to 500 points, while maintaining remarkable clarity and definition.

To help customize your documents, we also offer several additional font packages, as well as support for Adobe Type Manager™, giving you access to literally thousands of fonts.

And to keep your work pace moving, there's also QuickSpool™ II, GCC's serial print spooler, as well as QuickEnvelope™, our envelope printing desk accessory.

Dealer or Direct: Your Choice.

To order WriteImpact just call us toll-free and we'll give you the name of the GCC Technologies dealer nearest you. Order directly from us and you'll receive a 30-day money back guarantee, and all in-stock orders will be shipped overnight for only \$9.

The \$699 WriteImpact. The new employee that just won't quit.

800-422-7777.



**GCC
TECHNOLOGIES**

Peripherals With Vision.™

GCC dealers are independent businesses and as such they may offer different prices, policies, and service arrangements. In Canada call 800 263-1405. © 1990 GCC Technologies, Inc.

Circle 318 on reader service card

AD#02009A

\$295



\$249



Access text and graphics mainframe applications from one easy-to-use program

- **EMULATE** industry standard text and graphics terminals, including the DEC VT100, DEC VT200, DG D200, Tektronix 4014, and Tektronix 4105
- **COMMUNICATE** with a wide variety of mainframe computers or information services
- **TRANSFER** files using popular protocols, including XModem, YModem and Kermit
- **BACKGROUND** operation is supported under MultiFinder
- **SUPPORTS** Apple CommToolbox.

developed by



Import data, analyse the data, and generate high resolution scientific and business graphics from one easy-to-use program

- **FLEXIBLE** data import facilities
- **FAST** operation (5 to 20 times faster than CricketGraph™ version 1.3)
- **LARGE** data sets supported (32,000 data points per variable)
- **PROGRAMMABLE** RPN Calculator and Algebraic Formula entry
- **FEATURES** including: curve fitting; 15 plot types; log & linear scaling, zoom, and pan; automatic plot generation; hot links to data.



SYNERGY SOFTWARE

2457 Perkiomen Ave., Reading, PA 19606, 215-779-0522

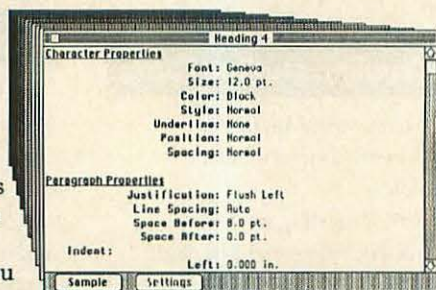
Circle 286 on reader service card.

MS Word Style Sheets Made Easy!

- ✓ Master the Power of Style Sheets
- ✓ Standardize your Documents
- ✓ So Simple - Learn in Minutes
- ✓ Professional Templates Included (Correspondence, resumes, newsletters & more!)

Stylist™

for Microsoft® Word



More than anything else, Word's style sheet capabilities separate it from the pack. If you're confused by the style dialogs, you may be missing out on all that formatting power. **Stylist** unlocks the secrets of Word style sheets by displaying and printing their contents in beautifully organized windows and reports. Compare Word's dialog (left) with **Stylist's** ZOOM window (right), and you'll see what we mean! Available now for only \$79.95.



SNA, Inc.
PO Box 3662 • Princeton, NJ 08543
(609) 799-9605

Order Toll-Free (800) 628-6442



Add \$5 S/H. NJ add 6% Tax
Requires Mac Plus/SE/II, Word 4.0

promise to the contrary, no further nuPrometheus releases have appeared. Quite probably whoever perpetrated the stunt was intimidated by the unexpected zeal of the investigation and wisely decided to stuff the whole enterprise.

Most Silicon Valley observers believe that Apple, perhaps through its outside security firm Kroll Associates (which reportedly employs a number of former G-men), has pressured the FBI into pursuing the case. As put to me by former Apple security head Ken Moore, "Part of the function of a [corporate] security department is to enlist the aid of law enforcement. That's not easy to do. It's not just a matter of picking up the phone."

In any case, by encouraging the FBI to go all out on this matter, Apple seems to have unleashed a sorcerer's apprentice on the Macintosh community. The suspect count is rising. Computer writer Stephen Satchell told me that during his interrogatory with the FBI in Reno, Nevada, he managed a peek at an agent's list of potential interviewees and counted about 60, in 39 states; Agent Cook's noncommittal comment on this was "maybe even more." Cook quite properly notes that it is a logical standard procedure to conduct a thorough investigation, "looking wherever we can to get information." This extends, I guess, to interviewing people just because they attended the Hacker's Conference or, as other speculation has it, because they participated in discussion on the WELL conferencing system.

But at what point does the investigation snowball all out of proportion to the crime, which, after all, seemed less a greedy or malicious act than a futile, ultimately silly ideological burst of electronic terrorism? Perhaps the line is crossed when people have to be careful about what they say at parties—because federal agents or their informants might be listening.

Which leads us to a final question: when does an investigation become a witch-hunt? **M**

Steven Levy is a Macworld columnist and the author of *The Unicorn's Secret: Murder in the Age of Aquarius* (NAL, 1989).

PRINTS GREAT. LESS SHILLINGS. THE NEW \$1399 PLP II.



Now you can have everything you ever wanted in a laser printer. Without paying the price.

Introducing the lowest priced laser printer in history: the \$1399 PLP™ II from GCC Technologies. GCC developed the very first personal laser printer in 1987, and has over 20,000 satisfied users... more than everyone else combined.

Finally, a revolutionary printer at a revolutionary price. In fact, at \$1399, it's nothing short of a technological marvel.

Personal Desktop Printing.

Three years of research and development have put the finest printer technology right on your desktop: a combination of the newest third generation laser engine, GCC's own custom designed integrated circuits, and the market's most sophisticated QuickDraw™ imaging software yet.

Features such as a silent "sleep" mode, a very user-friendly LCD display and an envelope printing desk accessory have been carefully integrated. In the future, should your needs include PostScript®, there's even a user-installed upgrade.

The Highest Quality Printing.

Because PLP II includes 6 outline font families (for a total of 22 individual fonts), its razor-sharp, clean output can be shaped, scaled, and rotated to any point size — all at a full 300 dpi.

These outline fonts, combined with GCC's powerful QuickDraw imaging software, give you unlimited flexibility in producing perfect documents from such applications as PageMaker®, Word®, Excel®, MacWrite®, MacDraw®, Persuasion®, and Canvas®.

Even More Power: PLP IIS.

For those who demand even more power, there's also the PLP IIS.

With the PLP IIS, you get all the breakthrough technology of the PLP II, only now, you get it at a swift 8 pages per minute, making it the perfect solution for anyone printing a high volume of output.

You also get one megabyte of RAM, which can save you valuable time. For example, while PLP IIS is printing, your Macintosh can be processing the next page of your document.

And finally, with PLP IIS, you get a very powerful font library. In addition to the core set of 22 Bitstream® outline fonts, you also get a font package called Font Plus™, which means you'll have over 40 fonts to choose from.

Dealer or Direct: Your Choice.

GCC has made acquiring your new PLP II or IIS just as easy as using it.

Simply call us toll-free, and we'll give you the name of your nearest GCC Technologies dealer. Or order direct from us, with a 30-day money-back guarantee and \$9 overnight delivery. The award-winning PLP II and the powerful PLP IIS. Everything you ever wanted in a laser printer. For less.

800-422-7777.

We gladly accept MasterCard, Visa, American Express, or your company's corporate purchase order.

PLP II \$1399, PLP IIS \$1899.



**GCC
TECHNOLOGIES**

Peripherals With Vision.™

GCC dealers are independent businesses and as such they may offer different prices, policies, and service arrangements. In Canada call 800 263-1405. © 1990 GCC Technologies, Inc.

Colin Chilver's prefers that his nightmares show up on the



silver screen, not his computer screen.



When you're an Oscar-award winning Special Effects Director with \$20 million on the line, there's one demon you never want to see.

A floppy disk that flops.

So Colin Chilvers, the special effects genius behind "The Legend of Hell House," "The Rocky Horror Picture Show," three "Superman" movies, and director of TV's "War of the Worlds," and the "Moonwalker/Smooth Criminal" video, takes no chances.

He relies on Sony, the worldwide innovators who developed the 3.5" floppy disk format.

Because it takes more than talent and money to make a major movie fly. And each of his multi-million dollar productions features vast computer generated data. From script writing and production schedules to shot lists, insurance and crew sheets.

If Chilvers loses just one of these vital bytes, he knows it could cost him his single-minded vision.

So avoid nightmares. Specify Sony floppy disks and data cartridges.

No director can risk a flop. And neither can you.



SONY.

Circle 208 on reader service card

When you're developing things people have never seen before, you need a special set of tools.

There's a reason why Apple has always been recognized as the place where the most innovative software shows up first.

We match the incredible power of Macintosh® computers with the most sophisticated developer tools on the market to help people create powerful new applications.

And now, through Developer Tools Express and APDA™, we're making these tools available to all developers.

So you have access to programs like Macintosh Programmer's Workshop and MacApp®.

These premier Macintosh development environments allow you to code applications in a variety of languages. Like C, Object Pascal and C++.

Or communications tools like MacWorkStation™ and CL/1™ that give you transparent access to data and

applications residing on remote computers.

And with its interactive nature, Macintosh Allegro Common Lisp™ — a complete implementation of the Common Lisp standard — lets you model your application quickly and fill in the details later.

To find out how easy it can be to obtain these tools, call us today. We'll tell you more about Developer Tools Express, APDA customer services and our developer training programs.

Because giving you the power to be your best isn't the only thing we do at Apple. We give you the tools to turn the power on.

To get your hands on Apple® development tools, call **1-800-282-2732***

The power to be your best.™

* In Canada, call 800-637-0029. If you don't live in the United States or Canada, but still live on the planet Earth, call 408-562-3910. © 1990 Apple Computer, Inc. Apple, the Apple logo, Macintosh, and MacApp are registered trademarks of, and APDA, CL/1, MacWorkStation, Macintosh Allegro Common Lisp, and "The power to be your best" are trademarks of Apple Computer, Inc.



Surveying the Shakeout

IS ANOTHER JASMINE IN THE WORKS?

BY DEBORAH BRANSCUM

Like a pudgy guy in a too-tight suit, hard disk companies are pretending that everything is normal at the same time that they're being squeezed from all sides. Profit margins are down. Competition is up. And the overall market for

third-party drives is getting smaller as the percentage of drives installed at Mac factories increases. As a result, marginal companies are at risk now more than ever. And consumers who make the wrong choice may lose big.

When John Fambrough bought a hard drive from Crate Technology last year, all he wanted was a decent product at a decent price. But when Fambrough's dealer sent the drive back for repairs they discovered Crate's price apparently didn't cover service. The drive sat at Crate for months. Then the company went belly-up and filed for Chapter 7. At this writing Fambrough has been without his drive for nearly seven months.

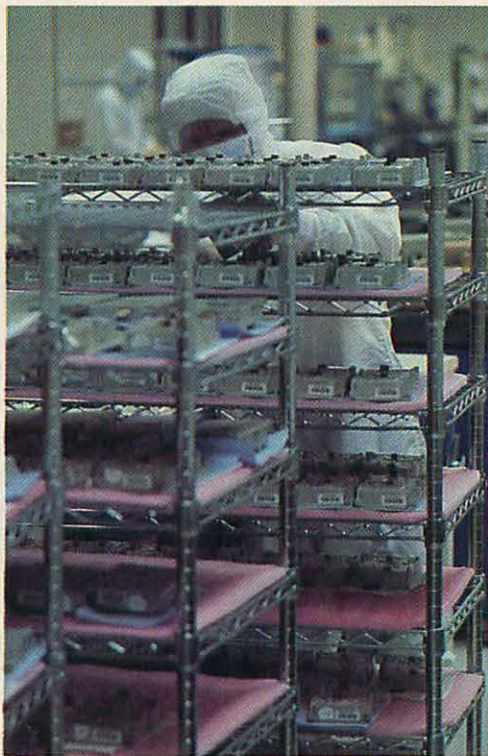
Crate was an early casualty this year, but it probably won't be the last. "It's safe to predict that half of the companies that supply disk drives will be out of business in three years," says SuperMac Technology president Mike McConnell. "And you'd better figure out which ones."

Why the shakeout? Insiders cite two basic reasons. First, it's been fairly easy to go into the business, with manufacturers and magazines offering supplies and advertising on credit to start-ups. Some companies do well early on but then go under when times

get tough, because of their executives' poor business skills. "These people confuse cash flow with profitability," says Kevin Curran, president of GCC Technologies. "They think that because a lot of cash is coming in they must be making money, when in fact they're building up debts that are unpaid. And since they don't have good financial controls, these guys don't even know they're going in the hole."

The second reason for the shakeout is lower profit margins. Last spring at least six companies, including Apple, cut prices on their hard drives. And new players, such as distributor MacAmerica, are joining the fray. Such cutthroat competition keeps prices down. But lower margins make it difficult "to provide the higher level of service that we want to provide and still make money at it," says Robert Jagitsch, president of Third Wave Computing, a small Apple value-added reseller in Austin, Texas. "There are a lot of competitors who make it hard to compete by cutting margins to the bone, offering inferior software, and offering what we consider to be poor levels of support. Unfortunately, the only way to prove to the customer that you provide good service is after you've made the sale."

According to SuperMac's McConnell, "It has become a commodity (continues)



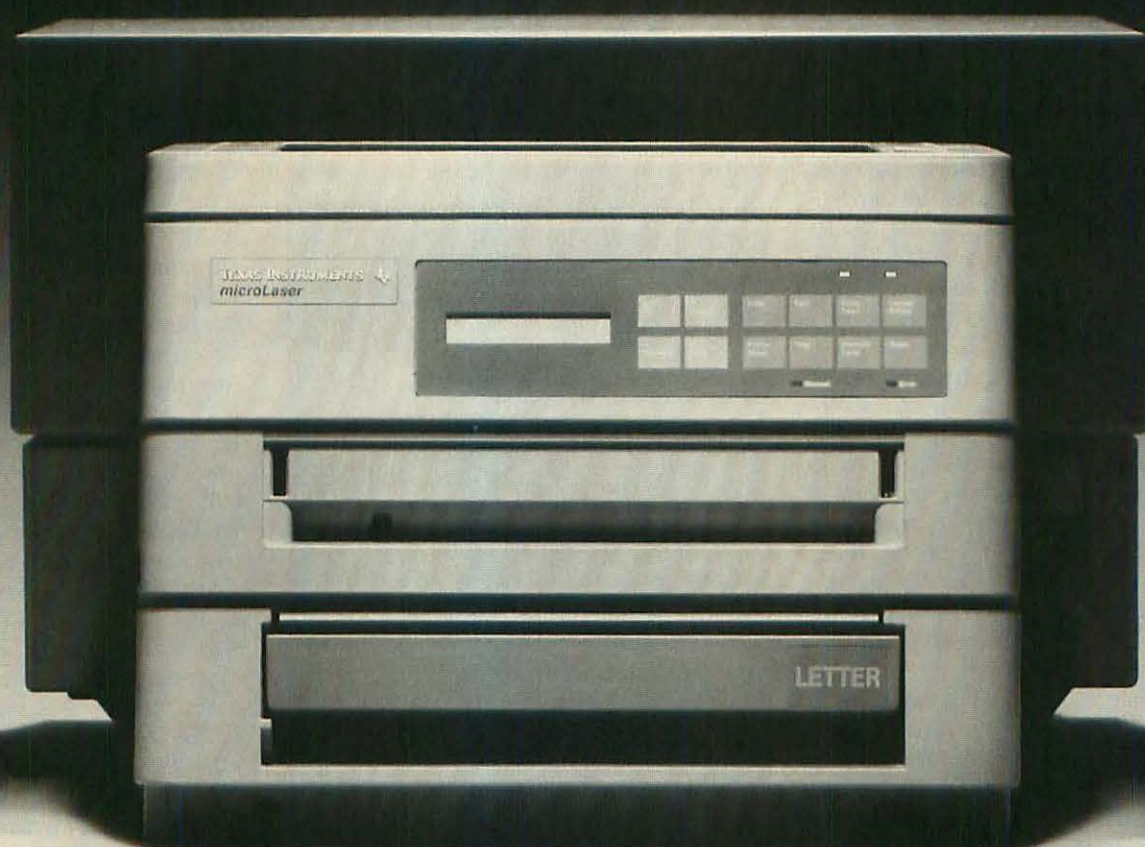
Quantum employees maintain clean conditions as they assemble and package hard disk drives.

get tough, because of their executives' poor business skills.

"These people confuse cash flow with profitability," says Kevin Curran,

PostScript[®] laser printers
used to be expensive, large and
shared by the entire office.

Until now.



microLaser™ from Texas Instruments: the affordable PostScript printer you can call your own.

Finally, for less than \$3,150,* you can have a true Adobe® PostScript laser printer right at your own desk. TI introduces its new microLaser — the perfect partner for your Macintosh®.

Small size. Lots of value.

When you place this printer next to your Mac, you'll be impressed by its small size and compact design. At only 13.4 inches wide and 14.2 inches deep, microLaser may be the small kid on the block, but it packs plenty of punch. This six-page-per-minute printer takes full advantage of virtually all of the software that runs on your Macintosh. That's because it uses

without turning off the printer.

True Adobe PostScript.

Because microLaser features the PostScript language, you can print fonts in a variety of typestyles, sizes, and orientations by scaling and rotating them to meet your exact specifications.

The PostScript language also gives you more graphics power so you can print precise lines and smooth curves. Integrating text and graphics is easy, and the microLaser can print even your most sophisticated page layouts and illustrations.

What's more, the PostScript

language is the industry standard for higher resolution output devices. So you can proof your documents on the microLaser, then print on any typesetter with PostScript capability without recreating the document.

Capabilities that grow as your needs grow.

One of the best things about microLaser is that you only buy what you need. Memory is upgradeable in 1MB increments up to a total of 4.5MB, and you can upgrade it yourself, without tools or technicians. All you have to do to get additional fonts is download through software or plug optional microCartridges

into two credit card-size slots.

Superior paper handling.

Part of what makes microLaser a truly personal, desktop laser printer that takes up so little room is its paper drawer, which slides inside. Because microLaser holds 250 sheets standard (it holds 500 when

New! PostScript printing just got more affordable — now only \$2,499.**

How do you enter the world of PostScript with its high-quality scalable fonts, integrated text and graphics, and broad software support? Buy TI's new microLaser PS17 — the laser printer that offers you more scalable fonts and other features, proving that great things come in small packages.

At just half the footprint of the HP LaserJet III, microLaser PS17 not only offers 17 scalable fonts (LaserJet III offers eight), they're PostScript fonts — the industry's standard for high quality. That means more than 4,000 software programs take advantage of microLaser's PostScript font capabilities.

Plus, microLaser PS17 offers the same superior paper handling as other microLaser models, is easily upgradeable and comes at a desktop price.

Why would you consider anything else?

Call TI at 1-800-527-3500 to find out more!



POSTSCRIPT®

you add an optional paper drawer), you spend less time refilling paper and more time creating superb-looking documents.

This printer also handles a variety of paper sizes and types — from letter, legal, and executive to transparencies, labels and envelopes. For those times when you're facing a large mail merge task, just plug in an optional envelope feeder to alternate between letters and envelopes.

Your own PostScript printer is a call away.

To find out more about how you can have affordable PostScript printing for your Macintosh, call today.

1-800-527-3500.



the Adobe PostScript language, offers 35 PostScript typefaces, 1.5MB of memory and an AppleTalk® Interface.

If you also use MS-DOS® Computers, you can switch between the PostScript language and standard HP LaserJet® Series II emulation easily


**TEXAS
INSTRUMENTS**

©1990 TI
66072

*TI suggested list price of microLaser PS with an AppleTalk interface. **TI suggested list price of microLaser Model PS17. microLaser is a trademark of Texas Instruments Incorporated. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. MS-DOS is a registered trademark of Microsoft Corporation. LaserJet is a registered trademark of Hewlett-Packard, Inc.

Circle 313 on reader service card

market in which customers are saying, with their checkbooks, I would prefer to pay a little less and get a little less. And they get away with it, usually, until their disk crashes and is in the shop for a month."

Many companies that sell drives are running scared these days, although they won't admit it. And the chief bogeyman who has them worried is Michael Ehman, president of Ehman. Ehman sells one line of drives direct and another, called Cutting Edge, through dealers. The company's glossy, attractive ads and low-cost drives have pulled in customers and bred dismay among competitors, who are careful not to mention Ehman by name when they discuss low-end companies.

Their line of reasoning goes something like this: we know how much it costs to build a drive and service and support it. There is no way companies like Ehman can make any money selling a 20MB external drive for \$299; at least there's no way they can build

organizations with strong service and support at those margins. Such companies may not be in financial trouble now, according to this argument, but they're shakeout candidates for the future.

Michael Ehman gets angry when he hears such talk and denies that his company can't live on its margins. "Our cost of goods is lower than our competitors', we believe, because we have economies of scale; because we have been at this for five years and are more efficient; and because we operate in Wyoming where we have a dramatic advantage in overhead," he says. Ehman owns its own factory and has employees who do much of the work other companies contract out. That's partly why he can charge lower prices, says Ehman. "My company really tries to make good stuff for as little money as we can and give it to the consumer for as little as we can and make a fair return. But it's not a Macintosh [market] return." Most Macintosh companies want a 40 percent return, Ehman

says; his company and his employees are willing to settle for smaller profits and lower paychecks.

The stability of a company is important when buying a product expected to last several years, but it isn't the only issue. Consumers must also weigh issues of quality, service and support, and price.

Quality Unless you're an expert, it's hard to judge the best drive. That's what *Macworld* tries to do in articles such as June's feature on midrange hard disk drives, which ranked drives based on our testing. So magazines are a good place to start, as are bulletin boards and user groups, to get a feel for the reputation of both the company and its drives.

Manufacturers Quantum and Conner get high marks for their mechanisms and so do high-end drives from Imprimis, which is now owned by Seagate. But the mechanism a drive uses is only one part of the equation.

(continues)

The continuing adventures of **MIGHTY MAC**
THE HERO OF HAPPY MAC'ERS

WE FIND MARVIN EAGERLY ANTICIPATING THE MASTERY OF HIS NEW MAC...

...HE SAID I'D BE AN EXPERT IN JUST 10 MINUTES

INITIALIZE MY WHAT?!

CORPORATELAND INSTRUCTIONS:
• INSTALL CARPS
• MOUNT SYSTEM
• INITIALIZE
• FORMAT TWEAK
• TRY AGAIN
• READ MANUAL
• BREATHE DEEP
• TRY AGAIN

...WRONG CABLE? WE CAN BACKORDER THE RIGHT ONE FOR YOU.

...STILL LATER... THERE'S GOT TO BE AN EASIER WAY

MAC WHO? CORPORATELAND

IN HIS MOMENT OF NEED MARVIN IS SAVED BY YOUR HERO... AND A CALL TO MAC FRIENDS!

COMPUTER SHOPPING CENTER WE CARE! (SORTA)

LATER...

YOUR NEW Mac FRIENDS SYSTEM IS ON ITS WAY... RIGHT TO YOUR DOOR!

AND TO THINK... IT EVEN COSTS LESS!

I LOVE IT!

Mac Friends OVERNIGHT SERVICE

Mac Friends INSTRUCTIONS:
1. UNPACK
2. PLUG IN
3. TURN ON
4. DO IT!

THE VERY NEXT DAY!

TO BE CONTINUED...

COMPARE YOUR LOCAL DEALER THEN CALL **Mac FRIENDS!** **800 331-1322**

CREDITCARDS LEASING FINANCING

SEE OUR OTHER ADS

Circle 262 on reader service card.

FREE
Disk



ARTICULATE
SYSTEMS, INC.

We are so convinced you will agree Voice Link™ is the best sound input device you can buy that we will send you a disk with entertaining and informative recorded messages and voice annotation from Voice Link and the top competitor's device. Hear for yourself the breakthrough in audio technology. Voice Link delivers unsurpassed quality.



Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: (_____) _____

Please check correct box. "I am interested in Voice Link for my.."

☐ Personal use ☐ Department at work ☐ Company



ARTICULATE
SYSTEMS, INC.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 06270 BOSTON, MA

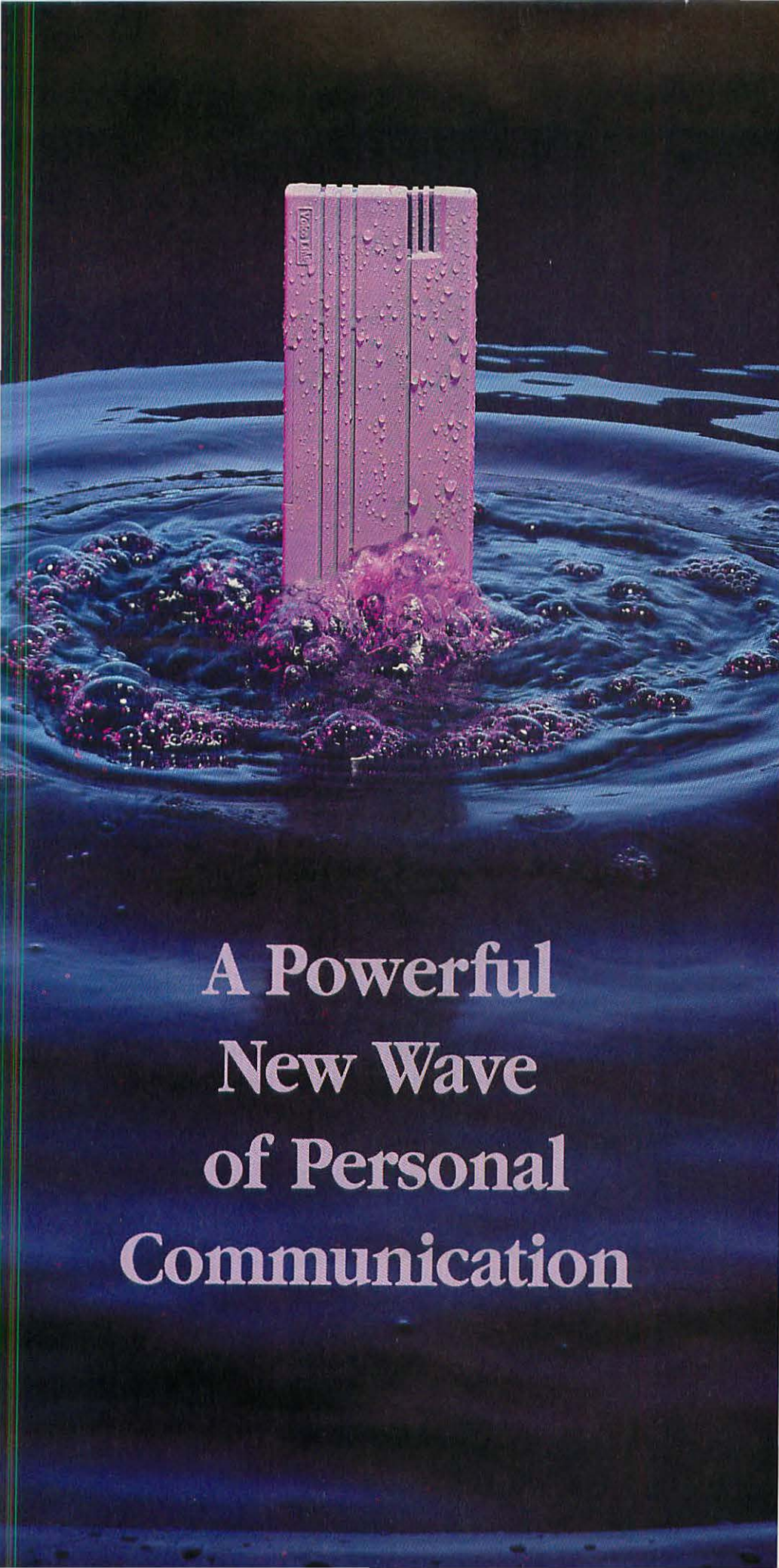
POSTAGE WILL BE PAID BY ADDRESSEE

Articulate Systems, Inc.
99 Erie Street
Cambridge, MA 02139-9709
Attn: Customer Relations



Detach Here and Mail Today





A Powerful New Wave of Personal Communication

Empower your Macintosh with quality sound input and voice communications. Articulate Systems announces a breakthrough in audio technology, which produces compressed audio files with exceptional sound fidelity on any Macintosh system.

Advanced audio technology brings a new level of quality to Voice Messaging, Voice Annotation, Intercom Links and Multimedia. Voice Link™ has a built-in Digital Signal Processor embedded with Macintosh Audio Compression Expansion routines (MACE) and digital filtering specifically engineered to maximize the clarity of voice communications.

Voice Link is an asynchronous, interrupt-driven device. You can record while your Macintosh continues to work on other operations, giving you the best audio quality without taking up a lot of memory or burdening your Macintosh with compression routines.

Voice Link comes complete with sound editing software, voice messaging software and lots of other tools to let you integrate sound. Voice Link gives you compressed audio files with unsurpassed fidelity.

Fill out the business reply card for a free demo disk or call 1-800-443-7077.

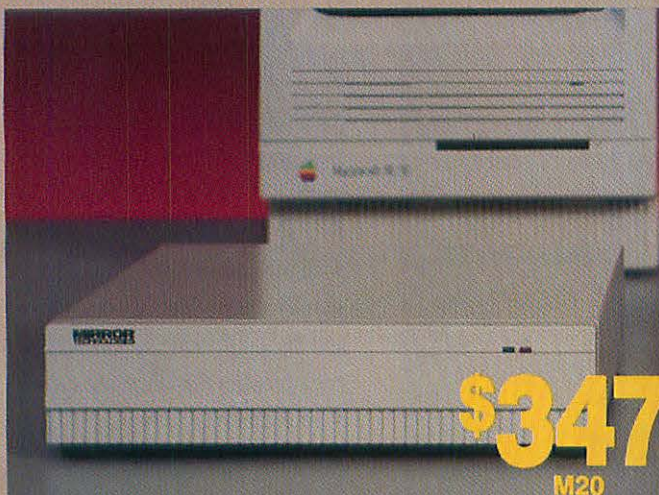


ARTICULATE
SYSTEMS, INC.

© 1990 Articulate Systems Inc., 99 Erie Street, Cambridge, Mass. 02139 (617) 876-5236. The Articulate Systems logo is a trademark of Articulate Systems. Voice Link is a trademark of Voice Link™ of Washington and is used by Articulate Systems with permission from Voice Link™ of Washington. All other brand names or trademarks are the property of their respective holders.

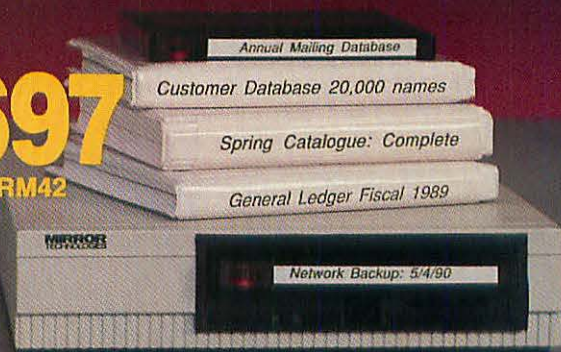
Circle 17 on reader service card

Save Enough On Our To Buy Our #1



New, Lower Price – Includes Cartridge!

\$697
RM42



"Order today, it's on your desk tomorrow."

R. E. L.
Ronald Eibensteiner, President/CEO

“Editors And Customers Love It!

The technology behind our RM42 is the first that editors unanimously rallied around. Editors, concerned about reliability, torture tested the cartridges (one even survived an accidental flight of stairs). Our RM42 delivers infinite storage on 42Mb cartridges, and it does it faster than most hard drives (20ms).

Editors also love our M series drives.

"If I could choose from all three manufacturers . . . I'd prefer the Mirror" – MacUser

Customers are using our RM42 removable drives everywhere and for everything:

- Publishers in New York are organizing projects by cartridge
- Designers in Sioux Falls are archiving entire clip art libraries
- Many of our customers are backing up data for the very first time with our RM42!

"Your [RM42] appears to be better built . . . and most importantly, it was quiet. Even better was your service. You have a product and personnel to be proud of."

– Judge E.R. Wedoff, Chicago, IL

We Repair The Competition's Drives



. . . and we've seen them all (Apple, Jasmine, SuperMac, GCC, PCPC, Ehman, and others). We've learned a lot about how (and how not) to build a hard drive. Most companies don't employ ESD static protection, pre-testing of sub assemblies, or utilize gold plated contacts. We do. So rest easy, your precious data is in good hands.

Factory Direct Saves You Hundreds

It's because of our direct strategy that we can deliver all this product and service at a great price. We eliminate the confusion and expense of middlemen. It's just you and us – the folks who build them.

Downtime . . . Practically Eliminated

You're not buying bookends. These are mechanical devices that spin at 3600 RPM for their entire life. That's why we created MirrorLoan, an overnight program that speeds a loaner to you. It's just one of the essential services you shouldn't be without.

We Hand Test Each M Series Drive

Size (Mb)	Int.	Ext.
20	\$267	\$347
30	317	397
40MP*	417	497
45	367	447
60	—	547
80	—	597
80MP*	667	747
105MP*	717	797
200MP*	1117	1197
290MP*	—	1997
580MP*	—	2497

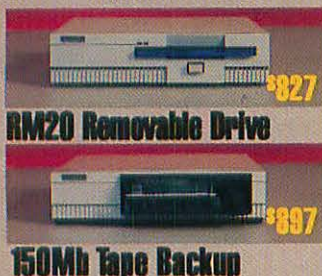
* MP designates premium drive

While most companies sample test, we test every drive so the drive *you* receive is hand tested. It arrives pre-formatted, and loaded with 10Mb of software. Inside are the best and fastest components available (Quantum, Imprimis, Seagate), an international power supply, SCSI switching, fan, and cables.

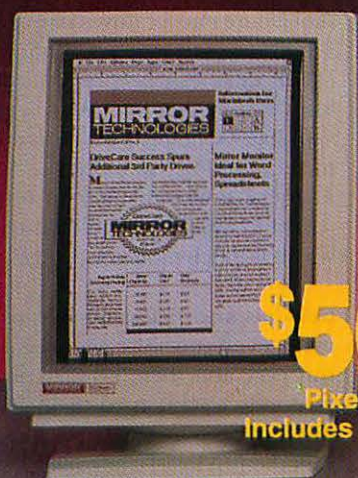
Our #1 Removable: The RM42

Here's what you get for \$697: Proven Syquest technology, full steel chassis, international power supply, convenience outlet, SCSI selection, RFI/EMI filtering, ultra-quiet fan, gold plated contacts, and all necessary cables. And it's backed with the longest supported warranty in the industry. It's everything you'd expect from a \$1,500 removable for \$697.

Remember, order today, it's on your desk tomorrow. ☺



PixelView II Display Removable Drive

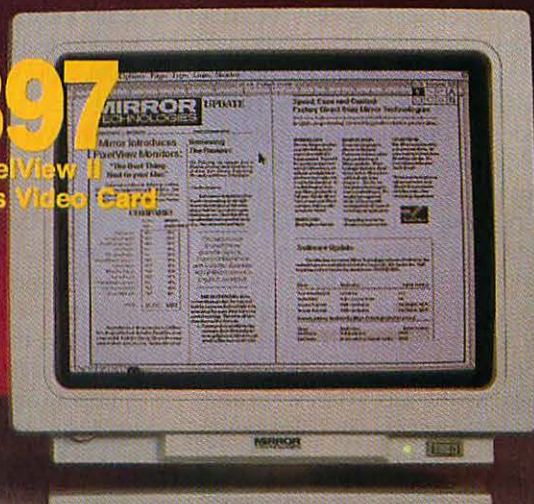


\$567

PixelView I
Includes Video Card

\$897

PixelView II
Includes Video Card



"I want you to test drive one for 30 days: Love it or Return it!"

Ronald Eibensteiner
Ronald Eibensteiner, President/CEO

"It Took Time To Build A \$1,700 Display System For \$897

We sourced tubes from the same folks as Apple. We chose the same phosphor. We tuned the system to 78hz vertical refresh rate to eliminate annoying flicker. And we built in enhancements like pop-up menus, sizable cursor and menu bar, screen saver, screen copy and more! With all this for \$897, what'll you do with the \$800 difference? (hint: check out our RM42)

From Plus To Portable; We've Got You Covered

We have a PixelView I and II system for every Macintosh being made: Mac Plus, SE, SE30, Mac II, IIx, IIcx, IIfx, and portable. Each PixelView system comes with *everything you need*: monitor, card, cables, manual, and software!

COMPARE!

19" Monitor	Radius	Mirror
Anti-glare	yes	yes
Both screens active	yes	yes
WYSIWYG	yes	yes
78hz vertical refresh rate	no	yes
Tear-off/Pop-up menus	yes	yes
Cursor sizing	yes	yes
Menu sizing	yes	yes
Screen saver	yes	yes
Screen copy*	no	yes
Full year warranty	yes	yes
Dealer Markup	yes	no
Street Price	\$1,695	\$897

(Best Street Price 4/1/90) *Mac II, SE/30

I Used To Think That Large Screens Were A Luxury. Now I Can't Live Without One.

Until now, large screen displays cost more than the computer (and yet even at those high prices, I found them to be the top productivity tool on my Macintosh). PixelView delivers *that same productivity*, but at prices anyone can afford.

Take One For A Test Spin (but don't say I didn't warn you)

Take my modem. Take my (gulp) hard drive, but leave me my monitor. I feel that strongly and believe you will too. Don't go another week squinting and scrolling — here's my personal guarantee to you — try either Pixelview for 30 days. If it isn't exactly what you expected, I want it back. Period. "

MIRROR TECHNOLOGIES

TO ORDER CALL
TOLL FREE

1 800 654-5294

FEDERAL EXPRESS

TECHNICAL SUPPORT HOTLINE: (612) 633-2105 Hours: Mon-Fri 8am-6pm CST

2644 Patton Road, Roseville, Minnesota 55113 (612) 633-4450 FAX: (612) 633-3136

Circle 424 on reader service card



All prices/specifications subject to change without notice. Call for current pricing, warranty, and promotional details. Mirror and MirrorImage are trademarks of Mirror Technologies, Inc. All other brand and product names are trademarks or registered trade names of their respective holders. No surcharge for Visa, MasterCard, Discover, and TeleCheck.

W006

Even those drives that use the same mechanisms can vary because of the type of software used, the quality of other drive components (such as the power supplies), and because the most demanding companies get the best drives. "If you were to divide our customer base into tiers, there are people in the top tier who place much different demands on us than do other tiers of customers," says David Brown, president of drive manufacturer Quantum Corporation. In practice that means disks rejected by companies with rigorous testing procedures are bought by someone else—and sold to consumers. Last year GCC found it needed to buy more drives than it had on order from Quantum, so the company turned to electronics distributors to make up the gap. "They were unusable as sold to us by the distributor," says GCC's Curran. The outdated products GCC bought had to be returned.

Some of these drives are just fine. Some of them are junk. "There's an enormous amount of crap on the

street in terms of hardware," says Brown. "It's dumped there—very low prices, older technology. And regardless of how you think of disk drives, it's amazing technology. It's got more technology than the computer has." Outdated drives are not the only problem. One exec told me a new product his company has not yet introduced is being advertised and sold by some mail-order companies, even though it doesn't yet have the ability to remap bad sectors correctly.

So ask a company about its testing procedures. How long is a unit burned in? What kind of testing is done? Some companies like GCC and SuperMac test all their incoming drives and reject those that don't meet their standards. Ehman, which used to rely primarily on the manufacturer to test its drives, is now testing all its products in-house as well. Microtech International, on the other hand, tests only a random sample of 25 percent of its drives, unless a problem is found.

You can ask companies what per-

centage of drives they send back to the manufacturer and what the mean time between failure (MTBF) rates are for the drives themselves, but those figures are really only useful for comparison. Although vendors have been willing to tell me about past fiascoes, I've never yet had one tell me its current failure rate for drives is more than 3 percent. And insiders confirm that MTBF rates can be pretty meaningless. "If someone puts out a flyer that says 200,000 hours of MTBF, it doesn't mean anything," says Brown. "When? At the 2 millionth unit? In ongoing reliability testing? Or in field testing, which is much more forgiving?"

Service and Support Because virtually every manufacturer has a bad run now and then, how a company responds to bad hard disks is even more important than how they prevent them. A lot of companies say they offer fast turnaround if a hard disk needs repair. Call up customer service and see if the representative ech-

INPUT...through...OUTPUT

The advertisement features a collection of digital imaging equipment arranged on a surface with a rainbow-colored gradient. On the left is a large, light-colored color scanner with its lid open. In the center is a smaller, light-colored video processor with a control panel. On the right is a thermal printer with a printed image of a person's face emerging from it. Below the printer are several small, rectangular color calibration targets. The background is dark, making the equipment stand out.

SC-7500
400 DPI Full
Color Scanner

SPI-3
Color Video
Processor

**Peripheral
Driver Software**

CHC-445
300 DPI Thermal Color
Cut Sheet Printer

oes the sales department or has a different notion about repair times. Is there a backlog now? For how long? Is there a difference between service under warranty and service after warranty? (One *Macworld* reader is steamed because a company assured him that if his drive was under warranty it would be repaired in 48 hours. Trouble is, the drive is more than two years old, so the company is dragging its feet in fixing it.)

More questions to ask: Does the company have dealers trained to repair the drives themselves, or do all drives get shipped back to the manufacturer for repair? How expensive are repairs after the warranty period is over? Is there a loaner program if something goes wrong? Who pays for shipping, and how is the hard disk shipped? Try calling the tech-support department. How fast do you get through? Another issue is product availability. Will the company let you know if shipment is delayed?

"We tell people 7 to 14 days. And

we're usually right on," says Joel Kamerman, president of La Cie. But if that estimate is wrong, La Cie doesn't normally call customers to offer an updated shipping schedule. And if the calls I get from readers are a fair indication, neither do other companies.

The age and size of a company may help you get a feel for its condition, but they offer no guarantee. Plenty of old and large companies have failed. If you're buying direct, does the company encourage you to send in a cashier's or a personal check? Steer clear of companies that don't accept credit cards, and never pay with a check. Will the card be charged when you order, or when the hard disk is shipped?

I asked several industry executives to tell me what hard disk they would buy if their companies didn't exist. Cliff Wildes, president of Microtech International, recommends Everex Systems because of the company's technical support. SuperMac's McConnell says, "Probably the safest internal drive is

Apple's because it's installed on the factory floor. Not the best choice, but the safest choice." Quantum's Brown agrees. "I would only buy one from Apple or companies that have rigorous testing and sampling procedures. If you had a Mercedes, would you go down to Grand Auto to put a generator in it?" GCC's Curran said he would look at Everex and Storage Dimensions, which was also mentioned by another executive. Another insider said he likes drives from GCC and Microtech. And SuperMac was mentioned by still another source.

There are probably scores of companies in the storage business, so narrow your choices before you start calling for answers. Or find a good dealer who will do much of that work for you, suggests Ken Krich, vice president of operations at ComputerWare, a Macintosh-only chain in northern California. "ComputerWare, for example, was a major Jasmine dealer, but ended its relationship with Jasmine (continues)

One source for all your graphics system peripherals... for all graphics systems



From Color Scanners, with GPIB or SCSI, to Video Processors, to Software, to Network Servers, to brilliant hard copy Shinko Color Thermal Printers available with SCSI,...Mitsubishi International is the only name you need to know.

One source for all your graphics system peripherals. We serve a range of systems which include Macintosh, Sun Microsystems, HP/Apollo, DEC, Silicon Graphics and others which are PC based. Our full family of quality peripherals enhance applications from CAD/CAE, to Imaging, to Pre-Press and Publishing, to Process Control, Presentation Graphics and beyond.

For more information call or write:

MITSUBISHI INTERNATIONAL CORPORATION
Information Systems & Services Division, Computer Graphics Dept.
East Coast Office: 701 Westchester Avenue, White Plains, NY 10604
(914) 997-4999 • FAX (914) 997-4976
West Coast Office: 3255-2 Scott Boulevard, Santa Clara, CA 95054
(408) 980-1100 • FAX (408) 980-8891

"Complete Graphic Peripherals Integration"

CHC-645

300 DPI Thermal
Color B Size Printer



SHINKO
SHINKO ELECTRIC CO., LTD.



Mitsubishi
International Corporation

Circle 52 on reader service card.

The *Easiest* and *Least Expensive* Solution to Macintosh Training

Does your company waste money on Macintosh computers and software? Would it surprise you to know that 60% of all new software purchased is abandoned within 3 weeks! This is according to a recent survey in *PC Magazine*. Statistics show that hundreds of thousands of dollars are wasted by companies and by individuals who purchase software programs that are never used.

Under-Used Computers and Programs

The survey only mentioned programs that have been put away on the shelf. It didn't add in the staggering number of computer users who use *only ten to fifteen percent of their program's capabilities*.

Think of the price of today's Macintosh software. It isn't cheap! A good example is the new PageMaker 4.0 which sells for nearly \$800. If you've purchased at least one of the leading word processing, database, spreadsheet, graphics, desktop publishing, and communication software packages you've invested thousands of dollars. Not to mention the cost of your computer(s), printers, hard drives, etc. Is this money wasted? Only if your Macintosh is half used, if your programs have been stuck on the shelf, or if the user is not 100% trained on the computer and your business programs.

An Expensive Irony

Right now thousands of individuals and companies are thinking about upgrading their hardware. They're going to invest in faster, more powerful, and more expensive machinery. They're also planning on spending thousands more on software upgrades and new software purchases. Ironically, few are budgeting equal amounts of money for training. The simple truth is that *training is the best investment you can make*. New equipment can increase productivity by micro-seconds. *Training* can increase productivity by days and weeks.

Training Options

Today there are many training options available. MacAcademy was the first to nationally offer both live workshops and video training. MacAcademy has specialized in Macintosh training for the past four years and has trained over 50,000 Macintosh users. Our experience has shown that VIDEO TRAINING is the most effective, fastest, and least expensive training option available.

Why Video Training?

Speed Learning: The Macintosh is a graphics based machine. It thinks and operates through the use of pictures. Unlike the IBM which is character and keyboard based, the Macintosh is a visual machine, the emphasis is

the screen. The best way to learn the Macintosh is by *seeing* each technique taught on the actual Macintosh screen. A MacAcademy Video shows you step-by-step each Macintosh technique. Each software technique is clearly and visually taught to the new user.

Flexibility: Videos can be used by individuals or shown to entire companies. Videos can be checked out and taken home by new employees. Videos can be fast forwarded and rewound to review key techniques. Videos are easy. Studies have shown that many Macintosh users are lazy. Training programs that take a great deal of individual time and effort end up sitting right next to the abandoned software. People already are used to watching videos. MacAcademy videos are usually used within the first two days!

Quality: There are other video training programs out there. Most of them are only 45 minutes to an hour. Nearly all MacAcademy training videos run a full two hours. Each trainer featured on MacAcademy videos is our highest rated instructor from the two-day live MacAcademy workshops featured in over 100 cities throughout the U.S. They're not actors or software sales people. They are business executives who have been chosen from hundreds of applicants due to their excellent teaching skills, their thorough knowledge of the program, and their hands-on business background using the featured program. MacAcademy instructors are unmatched in the industry.

Selection: A few other companies offer three or four training videos. MacAcademy now offers over 40 different Macintosh training videos (see next page for complete selection). For the Mac and for most programs you will find a video training tape for beginners, for intermediates, and for more advanced users.

Price: Each video is only \$49. Again, if you pay hundreds of dollars for the program and thousands of dollars for the computer, \$49 worth of training will make that original investment much more valuable.

Guarantee: MacAcademy is the most trusted name in Macintosh training. Over 10,000 companies currently rely on MacAcademy video training. We invite you to invest in the most effective and valuable Macintosh training available. If, for any reason for a full 30 days after receiving your Video Training Tapes, you are not totally satisfied, simply return the tapes for a full refund.

To Order: Please read the next page which lists all tapes now available and includes complete ordering information. Thank you for your business.

MacAcademy Introduces 42 Macintosh Video Training Tapes



MacAcademy Video Training Series™

477 S. Nova Rd. Ormond Beach, FL 32174 Dept. MW990

Order Phone: 800-527-1914 FAX 904-677-6717

Videos Only \$49 Each (Check Each Desired Tape)

Beg. Mac (Part 1)	FileMaker Pro (Part 1)	Freehand (Part 1)	QuarkXPress (Part 1)
Beg. Mac (Part 2)	FileMaker Pro (Part 2)	Freehand (Part 2)	QuarkXPress (Part 2)
Advanced Mac	FileMaker Pro (Part 3)	Word 4.0 (Part 1)	QuarkXPress (Part 3)
Adobe Illus.(Part 1)	FileMaker II (Part 1)	Word 4.0 (Part 2)	Quicken
Adobe Illus.(Part 2)	FileMaker II (Part 2)	Works (Integration)	Canvas (Part 1)
Dollars & Sense	PageMaker 4.0 (Part 1)	Works (W. Process.)	Canvas (Part 2)
SuperPaint (Part 1)	PageMaker 4.0 (Part 2)	Works (DataBase)	PowerPoint (Part 1)
SuperPaint (Part 2)	PageMaker 4.0 (Part 3)	Works (Spreadsheet)	Utilities, CDEV, INIT
Excel 2.2 (Part 1)	HyperCard Basics	Word Perfect (Part 1)	MacWrite II (Part 1)
Excel 2.2 (Part 2)	Small Mac Networks	Word Perfect (Part 2)	MacWrite II (Part 2)
Excel 2.2 (Part 3)	Paints & Draws		

Number of Videos: _____ Number x \$49: \$ _____ Add \$1 per Video S & H: \$ _____

Florida Residents add 6%: _____ Outside U.S. \$3/Video: _____ **TOTAL: \$** _____

NAME _____ COMPANY _____

STREET (No P.O. Boxes) _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____

CREDIT CARD NO. _____ EXP. DATE _____

SIGNATURE _____

M O N O T Y P E

Monotype

T Y P E

Classic

Fonts

A

UNIQUE COLLECTION

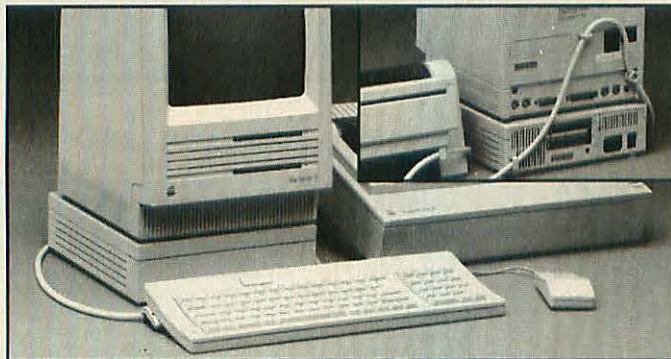
of Type1 fonts you won't find anywhere else,
 fonts you will find to be both beautiful and useful
 additions to your range of typographic possibilities
 — the best in type from A to

MONOTYPE TYPOGRAPHY INC
 Suite 504 — 53 West Jackson Blvd
 Chicago Illinois 60604
 312 855 1440 or 1 800 MONOTYPE

Z

Circle 31 on reader service card.

PREVENT MACINTOSH THEFT!



MacKablit Security System

Heavy duty 10' steel cable secures and locks computer, printer, other equipment, up to 4 components. The unique **MacKablit** system includes 2 brackets that snap into existing slots on the Macintosh or its peripherals. Additional hardware included for other peripherals that can be secured using existing screws in the equipment. **Internal component security:** **Kablit™** fasteners secure rear panel of CPU preventing unauthorized removal of internal boards and hard drives. When the cable is passed through the fasteners the screws are concealed. When the cable is passed through all the fasteners the Macintosh system can be secured to the desk...

List price \$39.95 plus shipping. Please specify **Mac, Mac Plus, Mac SE, or Mac II**. Quantity pricing also available. Money back if returned in 30 days. Purchase orders accepted. Send for catalog.

Kablit security systems also available for most computers.

Secure-It, Inc. 18 Maple Court • East Longmeadow, MA 01028
 1-800-451-7592 Dealer inquiries invited.



Circle 239 on reader service card.

SERVICE HERO

Keith Howells of Louisville, Kentucky, writes in praise of Paul Mandel, co-owner of Alliance Peripheral Systems. After Howells bought an Alliance 105MB hard disk, he had problems with reformatting. One Friday night at 7 p.m., he left a message for Mandel on CompuServe. By 9 p.m. Mandel had responded with several suggestions and a phone number. Still having problems, Howells called a couple of times on Saturday and was taken through a series of steps until the glitch was found and resolved. "I'd say that his fast response via E-mail and his willingness to support his product over the weekend are certainly worthy of mention," writes Howells.

nine months before Jasmine filed for bankruptcy because of problems with the company."

Krich says his company checks for speed, quality of construction, and features when deciding what drives to carry. The features he looks for include software quality and, for external drives, external SCSI connection, external termination, autoswitching power supplies (so you can plug it into either 110- or 220-volt power), and an LED light.

"Not every drive has all these features, but these are the things we look for," Krich says. ComputerWare also visits the company that makes the drives, talks to the tech-support people, and examines their testing procedures. "And we also try to review, as best we can, the financial status of the company. Because many of the companies in the hard drive business are very small and undercapitalized and we don't want to take a risk that a company we deal with won't be around to fulfill its warranty."

But what if you don't want to go through a dealer? "There are good drives available through direct distribution. We sell two of them—

(continues)

Microtech and GCC," Krich says. "The problem for the buyer is identifying which companies in the direct channel are good solid companies."

La Cie sells drives both direct and through dealers. While insisting that La Cie offers good service (such as replacing bad drives with larger capacity ones to speed repairs), Kamerman says that local support and long-distance support are not the same. "Users think they should get the same service from mail order as from dealers," he says. "They don't understand there's a difference."

Kamerman's honesty may lose him a few fans, but it shouldn't be surprising that local service and support may differ from what you get when buying direct. Some people are willing to pay for the difference; others argue that there is no difference. The difficult task for consumers is balancing price, quality, and support issues to choose the hard disk that's right for them.

Jasmine, Crate, Heart Data News

As of this writing, Jasmine expects the bankruptcy court to approve its reorganization, which gives French company Chess SA 70 percent ownership of Jasmine, with creditors owning the remaining 30 percent. Jasmine says the Chess investment will speed repair turnaround and product fulfillment for customers forced to wait for months while the company got its financial affairs in order.

Meanwhile, Microtech International has expanded its offer on Jasmine drive warranties. The company will honor warranties on hard disks with mechanisms from Quantum, Micropolis, and Toshiba. (Remember, opening a drive voids the warranty, so use SCSI Probe Software, available from many user groups, to pinpoint the drive's manufacturer.) Call 800/626-4276 for details on the program.

Racet, which manufactured many of Jasmine's high-end DirectOptical disc drives, DirecTape drives, and multiple-drive subsystems, announced that it will honor warranties on those products. Call 714/579-1725 for info.

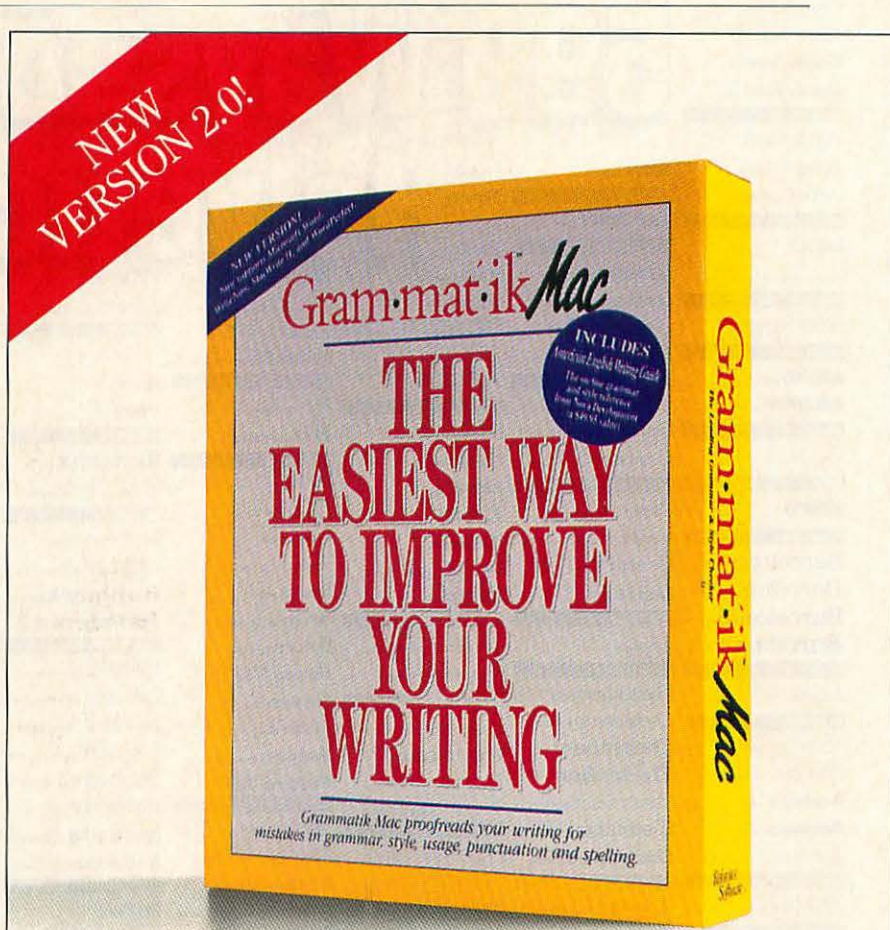
Crate Technology president Chris Lemoine says that investors have formed Data Storage Development to buy the assets of the old Crate Technology and relaunch the business with

the same name. Crate's telephone number, 818/766-4001, is back in service and Lemoine says the new company will honor the old warranties.

Heart Data Corporation closed its doors in mid-June, according to Data Enhancements of Westlake Village, California. Data Enhancements president David Barton said his company is manufacturing Heart Data's hard

disk drive products and honoring its warranties. You can reach Data Enhancements at 818/879-2700. **M**

.....
Send nominees for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107 or via AppleLink (Macworld1) or Connect (Branscum).



Guaranteed.

The #1 grammar and style checker for the Macintosh® just got better. Introducing Grammatik Mac 2.0, the only software that's guaranteed to make your writing clear, concise, and correct. Grammatik Mac proofreads your writing for thousands of grammar, style, usage, punctuation, and spelling errors. It will improve your writing in 30 days or your money back. Guaranteed.*

Grammatik Mac
The #1 Grammar & Style Checker

Reference Software International, 330 Townsend Street, Suite 123, San Francisco, CA 94107. (415) 541-0222.
*See your dealer for details. Grammatik Mac users call for a free upgrade. Grammatik is a trademark of Wang Laboratories. © 1990

Macworld Booth #1706



599 Ways To Avoid Helvetica

[illegible]

Typefaces listed are licensed from the International Typeface Corporation (ITC), Visual Graphics Corporation (VGC), Kingley/ATF, Fundición Tipográfica Neufville SA & Monotype. Helvetica is a trademark of Linotype AG and its subsidiaries. This ad was created on a Mac II using Aldus PageMaker 3.02, Adobe Illustrator 1.83, Silicon Beach Digital Darkroom. The text was set with the Futura & Futura Condensed families from the Image Club Typeface Library and output as negatives on a Linotronic 1300 PostScript imagesetter.

Too many fonts for one page! This is the Image Club PostScript Typeface Library. We've developed 600 licensed typefaces in Mac or PC format for use with any PostScript printer. Fonts are available on diskettes, on the LetterPress™ CD ROM (which contains our entire library of 600 fonts), or on the Art & Type™ Vendor CD ROM.



The Art&Type Vendor CD ROM uses a special program to unlock typefaces and clip art from the CD ROM as they are required. The Vendor costs \$199 and includes 20 fonts and 1 volume of Digit-Art™ EPS clip art. Buying additional fonts or clip art from the Vendor is as easy as making a toll-free phone call. Image Club will provide an access key that unlocks the fonts or clip art images from the CD ROM. With the Art&Type Vendor you'll never miss another deadline waiting for a font to arrive.

Image Club fonts include both type 3 and type 1 PostScript fonts which guarantees compatibility with virtually any Macintosh application including Adobe Type Manager™ (ATM). With ATM you can print Image Club type on non-PostScript printers such as an ImageWriter or a LaserWriter TSC. Our fonts also include PostScript artwork files. With Illustrator™ or Freehand™ you can customize characters, creating unique type-based designs.



Image Club type is compatible with Ventura™, PageMaker™ (Windows) and Corel Draw™ for use with any PostScript compatible printer. Image Club fonts will work with non-PostScript printers like an HP LaserJet™ when combined with PostScript software such as PreScript™, Freedom of Press™ or a PostScript card.

Whether you buy fonts on diskette, from the Art&Type Vendor CD ROM, or the whole library on the LetterPress CD ROM, our pricing and discount schedule make it easy.

Each font \$25. Minimum purchase \$50.

Please note that typeface families cannot be split up.
Discount schedules:

Discount schedule:

10-30 fonts	20% off	131-210 fonts	25% off
-------------	---------	---------------	---------

10-30 fonts	20% off	131-210 fonts	35% off
31-70 fonts	25% off	211-300 fonts	40% off

71-130 fonts 30% off

CD ROM

Letterpress CD ROM Full disc (all 600 fonts) \$499

Letterpress full disc with NEC CD ROM drive \$539

Art&Type Vendor CD ROM	\$199
------------------------	-------

(Includes 20 fonts and 1 volume of PostScript Digit-Art™ clip

To view the entire library of 600 fonts call for your free catalog. The Image Club Typeface Library on diskette or CD ROM is available from your dealer or directly from Image Club.

Orders Within the US Call
Fontline!
800-661-9410
VISA, MasterCard and American Express.
For a Free Catalog or Orders Outside
USA Call (403) 262-8008



Paying the Piper

SYSTEM 7.0 PROMISES BETTER COMMUNICATIONS BETWEEN APPLICATIONS—BUT AT A PRICE

W

BY BRUCE F. WEBSTER

With the release of System 7.0 (probably early in 1991), Apple will offer its first major advance in interapplication communications (IAC) in seven years. The advance is long overdue, especially in light of competing developments from

Microsoft, Hewlett-Packard, and Next. In theory, the benefits will be great: applications will be able to send requests to one another, return status information, and, perhaps most importantly, exchange data.

But there is a catch. Support for publish and subscribe, AppleEvents, and other IAC features will not magically appear in applications running under System 7.0—they will have to be added. All this is not to fault Apple for the introduction of IAC in System 7.0. But to implement IAC capabilities, software companies must develop new versions of their applications, new versions compatible with other applications. This also means that to take advantage of IAC, Macintosh users will need to upgrade all of their applications.

No one knows how long it will take until all the applications and utilities we use will be available with support for IAC. And we don't know how well they will work together. Or how much we'll end up paying for all those upgrades. Moreover, it's not even clear exactly what additional features System 7.0 will have, because Apple is still working on it.

Apple gave more details about System 7.0 at its Worldwide Developers' Conference in May. As it stands now, the proposed IAC facilities in System 7.0 will work on three levels:

- dynamic data interchange (the pub-

lish-and-subscribe concept controlled by the Edition Manager);

- high-level events (such as AppleEvents); and
- low-level communications (data transfer via virtual ports).

Let's look at how each major IAC function works and what issues might arise in implementing them.

The Edition Manager

System 7.0 will introduce a so-called live version of copy and paste. The new functions are called publish and subscribe, respectively, and they will be controlled by a new portion of the operating system known as the Edition Manager.

The basic idea is simple: you open a document within an application; select the data (text, and so forth) that you want to publish, and then choose Publish from the Edit menu. A dialog box will appear, allowing you to save the published selection with a given name and in a given location; the file created will be called an edition. A border will appear around the published selection, to indicate that it's a publisher.

To use that edition in another document (which may be created using another application), you will choose the insertion point—just as if you were going to paste—then select the Subscribe command from the Edit menu. Again, a dialog box will appear,



allowing you to locate the desired edition. Then the data in the edition will be inserted in your text with a border around it, marking it as a subscriber.

From that point, each time you save the original document, the application will write to disk any changes made to the publisher in the corresponding edition file. Likewise, each time an application opens a document subscribing to that edition, the application will read in the updated edition. Also, you will have the option to disable automatic updates for a given publisher or subscriber. A given edition will be able to have multiple subscribers (or publishers).

For example, with this facility you could—in theory—create a diagram in MacDraw II, publish it, then subscribe to that edition from within documents created by Word and Persuasion. *In theory* is the key phrase here. That's because Claris, Microsoft, and Aldus will first have to write (and release) new versions of these applications designed to work with the Edition Manager (and System 7.0), and you'll have to upgrade to those new versions. *(continues)*



Double the Capacity of Any Disk Drive

with
DiskDoubler

"DiskDoubler rates as the best of its kind" —Steve Bobker, MacUser

DiskDoubler™ is a remarkable new software program that dramatically increases the storage capacity of any Macintosh disk drive. Simply select a file, and choose "Compress" from the DiskDoubler menu in the Finder. Blindingly fast, DiskDoubler compresses your files by a factor of two, three, or even ten times!

MacUser's toughest reviewer Steve Bobker reported: DiskDoubler's "Performance is outstanding." Bobker went on to give DiskDoubler 1.0 a four-and-a-half mouse rating.

DiskDoubler 2.0 is now available, with new features that make it even faster and easier to use. If you know how to use the Finder, you already know how to use DiskDoubler. And DiskDoubler uses an ultra-safe scheme that prevents data loss—even if the power fails.

Everyone should have DiskDoubler. It's like getting another hard disk for free. That's why exhilarated users have made DiskDoubler a best-selling product.

Get DiskDoubler today and join the thousands of Mac users who've discovered that there's no easier, faster or more reliable way to increase the capacity of their disk drives.



See DiskDoubler in action at MAC-WORLD Expo/Boston, booth #159.

Salient™

Salient Software, Inc.
3101 Avalon Court
Palo Alto, CA 94306
(415) 852-9567

Available from MacConnection at 800-334-4444.

Generally speaking, all the applications involved must implement publish-and-subscribe functions for this process to work. Still, you will be able to subscribe to nonedition files, which means that sometimes you'll be able to get by with the publish-and-subscribe functions in your destination application only.

The publish-and-subscribe mechanism will work over AppleTalk, so that if you're on a network you'll be able to publish editions on your system and another person on the network will be able to subscribe to them (and vice versa). This is an advance in work-group publishing over AppleTalk, ideally allowing several individuals to work easily on different portions of the same single document. Each contributor could publish the elements (text, figures, graphs) that he or she is responsible for; the group coordinator would lay out the document and subscribe to all the required editions.

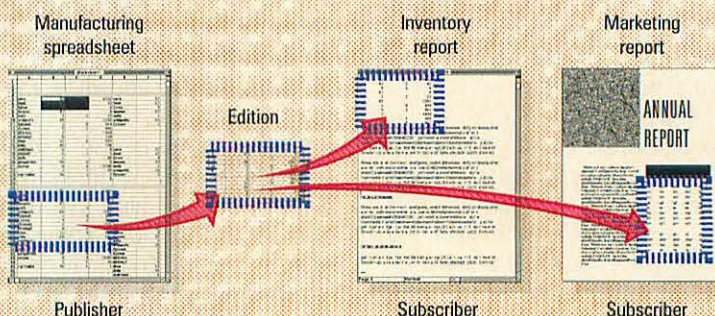
Some issues remain unclear. For example, what will happen if you have a publish-and-subscribe chain with multiple links? Case in point: You have numbers in a spreadsheet that you publish to an edition (which we'll call

Sales). You have a charting program that subscribes to Sales, using those numbers to create a bar graph, which it then publishes to the edition SalesGraph. Finally, you have a word processing document that subscribes to SalesGraph. So far, so good. Now, you go back into your spreadsheet and modify some of the published cells, which your application then copies to Sales. Finally, you open your word processing document—which still has the SalesGraph chart based on the old spreadsheet values. According to current documentation, that chart (and SalesGraph itself) will remain outdated until and unless you open the chart document, which will then import the updated version of Sales and export a corresponding version of SalesGraph.

It was that issue, among others, that led ACIUS (maker of 4th Dimension) to implement its own hot link manager (HLM). ACIUS says the company's HLM kernel keeps track of all dependencies and can handle multi-link chains automatically, updating all editions along a chain. However well-intentioned such efforts are, though, they are limited to related applica-

(continues)

HOW PUBLISH AND SUBSCRIBE WORKS



The publish-and-subscribe functions of System 7.0 will let you open a document within an application, select the data that you want to publish, and then choose the Publish command from the Edit menu. The file created will be called an edition.

A spreadsheet could be a publisher, for example, with manufacturing data subscribed to by both an inventory report that is a word processing document and a marketing report in a page-layout program. As numbers in the spreadsheet changed, the inventory report figures would change too, once the document was opened. The marketing report would also be updated once it was opened.

Circle 19 on reader service card.

What Created



Think.



All the Macintosh® applications above were developed in THINK C® or THINK Pascal®.
Could it be coincidence? Think.

SYMANTEC.

tions—a dead end when compared with Apple's approach (assuming everyone jumps on the IAC bandwagon).

AppleEvents

From the start, Mac programs have been event driven, that is, they respond to events (mouse clicks, key presses, and so on) generated by the user or by the operating system. Sys-

tem 7.0 will introduce a new category of events called AppleEvents. This category will allow applications to send events to one another, typically to request services, respond to a request, or notify of a condition. But with the new events will come new headaches and concerns for developers.

Apple proposes three classes of AppleEvents. The first class, standard

AppleEvents, will represent messages from the operating system. For example, the Edition Manager will send an AppleEvent to an application to inform it that an edition to which it subscribes has been updated; the application will then be responsible for reading in the new edition. (Note: an application must detect and respond to all standard AppleEvents to comply with System 7.0 standards.)

The second class, registered AppleEvents, represents standard AppleEvents specific to a given application or class of applications. This is where the headaches come in. The idea is that Apple will register and publish these events, much like the file-creator and file-type IDs, so that other applications can be modified to respond to (or to send) them. For example, Microsoft might register an AppleEvent for Word that tells Word to save the current document as a text-only file. That way, another application faced with importing (and converting) a Word document could instead ask Word to launch itself (a standard AppleEvent), to open the indicated document (another standard AppleEvent), and then perform the desired conversion (our hypothetical registered AppleEvent).

The third class, private AppleEvents, represents nonregistered events used between coordinating applications. For example, Claris might devise a set of private AppleEvents to communicate requests and information between its various applications, such as FileMaker, MacDraw II, and Claris CAD. (In fact, Claris has used its own technology to coordinate efforts between FileMaker and Claris CAD to demonstrate the concepts of IAC.)

Apple's dream: smaller, modular programs that perform a given task very well and that interact with each other. These concepts are good, but much work remains to be done for Apple's dream to become reality. At the Worldwide Developers' Conference, developers raised two major questions. The first was, Who decides what the registered AppleEvents are and how they're defined? Many developers expressed concern that the process would be dominated by a few major players (Microsoft, Claris, *(continues)*

Effects Specialist

Font Styling at its Finest!

With Effects Specialist™ simply type in a letter, word or sentence and click on the available options in convenient pull-down menus to obtain eye-catching typographical art! So easy to use, anyone can create dazzling headlines or logos. So powerful, no one should be without it.

From the basic library of 110 effects, virtually billions of variations are possible. Elegantly subtle or ultra flamboyant effects can be created to fit any graphic situation. Your only limit is your imagination!

Combining features like WYSIWYG (What You See Is What You Get), color, kerning, rotating, skewing, horizontal scaling, and a background generator, even novices can obtain professional results.

Use with bit-mapped or PostScript™ fonts and print to any printer (PostScript™, color, even dot-matrix). Print from Effects Specialist™, or export as a PICT or EPSF file into your favorite page layout program.

Minimum requirements:
Macintosh Plus™, 1 Meg RAM.
Suggested retail price \$249.95.
Soon to be released on the IBM™.

Available from your nearest dealer or call

POSTSCRIPT INTERNATIONAL, INC.
27811 Avenue Hopkins
Suite 6
Valencia, CA 91355
(805) 257-1797

See you at the
Seybold
Computer
Publishing Exposition
October 3-5, 1990
Booth #438

Beyond Reality.

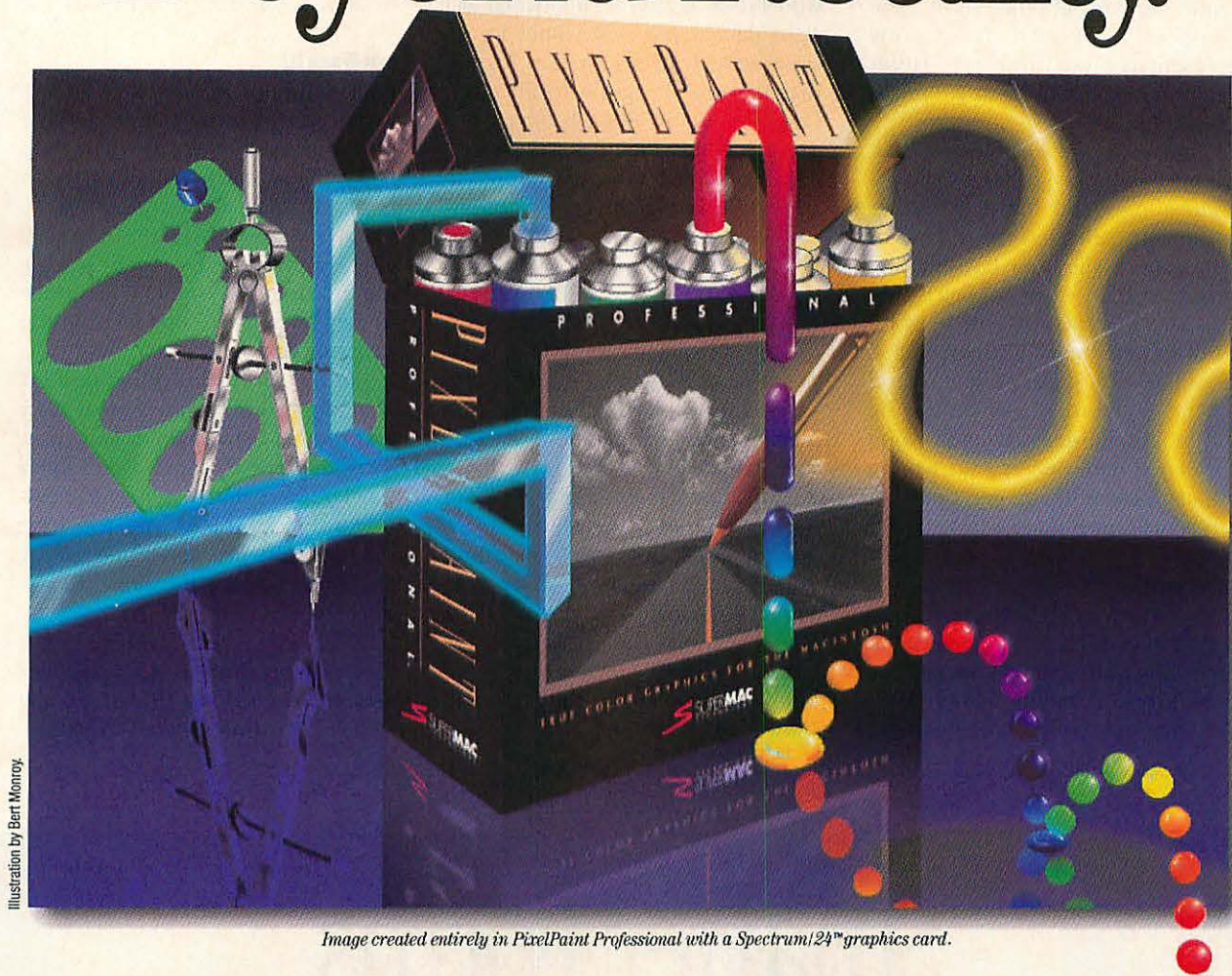


Illustration by Bert Monroy

Image created entirely in PixelPaint Professional with a Spectrum/24™ graphics card.

As a designer, you need tools as unlimited as your imagination. You need PixelPaint Professional™, the first True Color paint program. It lets your imagination tinker with reality. Not just image processing, but image *creation*.

PixelPaint Professional gives you all the traditional paint tools you're used to, and a vast selection of advanced tools for dazzling special effects. Like ultra-smooth graduated fills and anti-aliasing. Full transparency control. Dynamic masking. And the most sophisticated airbrush around. You can choose from a nearly endless spectrum of custom palettes, and seven different color pickers. Including 4-color process, RGB, and PANTONE®*Color.

And PixelPaint Professional is a universal paint program. It supports any color depth from 8- to 32-bits—so you don't have to buy new software when you upgrade from 8- to 24-bit hardware.

So if you design anything on the Macintosh®, then take your imagination beyond reality with PixelPaint Professional. Ask for it by name at your local SuperMac Software reseller.



Aldus), with little representation for smaller firms. Simultaneously, the attendees recognized that a truly representative (and thus very large) committee wasn't going to get much accomplished.

The second major question was, Just how does one go about writing a modular program? Initial developer complaints centered on a lack of sample programs, but beyond that there are a few chicken-and-egg issues. Modular programs will only be competitive when there is a large installed base of other modular programs (and System 7.0) for them to interact with. And the AppleEvents required won't be defined until people start writing modular programs and find out what they actually need (and want).

Virtual Ports

In some cases it may be useful for two applications to have closer links and more immediate communications than those provided by the Edition Manager and AppleEvents. For example, a

graphing application may be linked with a data-acquisition utility that will chart data as fast as it comes in. To support such needs, System 7.0 will provide the Program-to-Program Communications (PPC) Toolbox.

The PPC Toolbox introduces the concept of a port, a virtual (nonphysical) device through which applications can communicate. Through a connection to a common port, two applications can use low-level PPC I/O functions to pass data back and forth quickly. As with the other IAC facilities, PPC ports will connect applications over AppleTalk, allowing programs running on different Macs to share data readily.

Still, that capability may turn out to be something of a liability. If several applications on various machines are communicating via ports over AppleTalk, network performance may take a real hit. This is not to argue against AppleTalk functionality, but to point out that use of the proposed IAC functions may have some unan-

anticipated effects on system and network performance.

Is It Worth It?

Four questions remain. Will Apple's IAC proposals be fully implemented? When will IAC functionality become a reality? How much will you have to pay for it? Will it all be worth it?

My best answers: for the most part, yes; by early in 1992, a year or so after the release of System 7.0; serious money for software upgrades; in the long run, yes.

In the short run, you're best off planning to living with System 6.0.x and the old-fashioned cut and paste for some time to come. Don't jump quickly onto the System 7.0 bandwagon unless you're sure you have the time, patience, and money to pay the piper that plays the tune. **M**

Contributing editor Bruce F. Webster can be reached via BIX (bwebster) and via MCI Mail (Bruce Webster).

Smarter Forms

Whether it's invoices, travel expenses, office memos or tax returns, Informed™ can help you transform mountains of paperwork into well-organized forms of information.

It's a new way to draw, fill out and manage forms.

Informed Designer

Informed Designer™ comes packed with high performance drawing features.

Grids, guides, rulers, tables, fields, combs, lines, ovals, rectangles, arcs, polygons, type—plus a whole lot more. All with over 1/1000th of an inch accuracy.

Draw or scan. Make revisions in minutes. No more obsolete forms.

SmartForm users!

Now's your chance to get both Informed Designer and Informed Mini-Manager for only \$149 (a \$384 value). Please call for more information.

Informed Mini-Manager

With Informed Mini-Manager™ (sold separately), filling out forms becomes an effortless, error free task.

With built-in intelligence, your forms can calculate, choose and lookup information automatically.

And since Informed Mini-Manager is actually a database, you can store and organize your forms like never before.

So it's time to get Informed. Just give us a call. We'd be happy to tell you more.

Shana Corporation
Advanced Technology Center
105,9650-20th Avenue
Edmonton, Alberta Canada T6N 1G1
Tel. (403) 463-3330 FAX (403) 428-5376

WORLD CORPORATION
12345 - 123 Street, New York, New York 12345 Tel. (212) 555-1283
NAME: Smith, John
ADDRESS: 12345 Street, New York, New York 12345
PHONE: 212-555-1283
DEPARTMENT: 8817-A

PRE-TRAVEL PLANNED EXPENSE

TRAVEL NO.	DATE	TIME	LOCATION	REMARKS
1	March 21, 1989	7:45 AM	San Diego, California	Departure
2	March 21, 1989	1:00 PM	San Diego, California	Arrival
3	March 21, 1989	7:45 PM	San Diego, California	Departure
4	March 21, 1989	1:00 PM	San Diego, California	Arrival

HOTEL
Name: Northwest Airlines
Room No.: 11
Rate: \$11.4

OTHER / MISC. EXP.

Circle 297 on reader service card



\$79.95
Surge Suppressor



\$499.95
APC UPS 370ci

Why the power protection unit on the left is more expensive than the one on the right.

As you can see, the surge suppressor on the left costs a few hundred dollars less than the APC Uninterruptible Power Source (UPS) on the right. What you don't see is that it could end up costing you and your business thousands of dollars in hidden and unnecessary expenses. That's because surge suppressors protect against a disturbingly low percentage of total power disturbances.

According to Bell Labs, surges represent only 8% of the power problems that affect computers. What's more, the sags, brownouts and blackouts that make up the other 92% can be just as damaging to the hardware and software of your Macintosh as that first 8% – resulting in costly data loss, system downtime, and service costs.

That's why APC offers a

selection of UPS systems for the Macintosh. Only a UPS system gives you 100% protection against the complete range of power problems that routinely affect computers and data.

And among major manufacturers, only APC offers a complete line of UPS systems *designed specifically* for the Macintosh.

In fact, we're the leading developer of power protection equipment for micro-computers – servicing hundreds of the nation's largest corporations.

APC UPS protection helps you ensure the cost efficiency of your business applications and the integrity of your creative work.

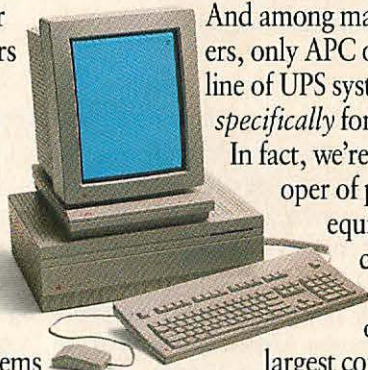
And because power disturbances can potentially do more damage to

networked systems than to single-user systems, APC offers PowerChute UPS Monitoring software for automatic, unattended shutdown of your AppleShare file servers.

All of these benefits prompted *Macintosh Buyer's Guide* to comment, "...the APC UPS systems are indispensable...[They] represent a solid value and perform above their specifications."

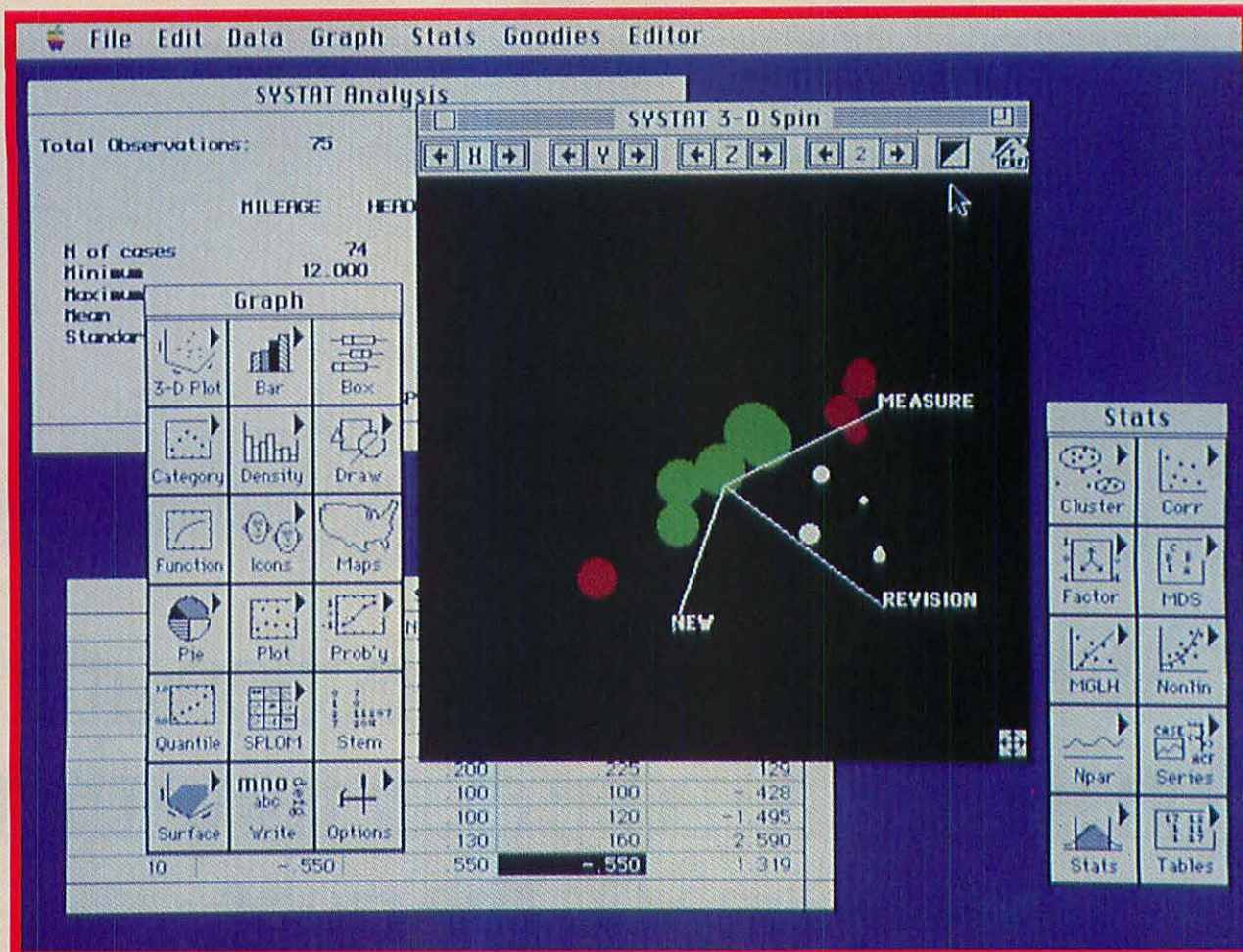
No matter which Macintosh model you use, APC offers a UPS system designed to be fully compatible with it. The Model 110SE is designed for use with the Macintosh SE, SE/30, Plus, and 512 computers. For the Macintosh II family, there's our higher-rated UPS Model 370ci.

For more information, call us at 1-800-541-8896 – or contact your nearest Apple Dealer.



APC
American Power Conversion

P.O. Box 278, 132 Fairgrounds Rd., W. Kingston, RI 02892
Phone 1-800-541-8896 FAX (401) 789-3710 AppleLink D3016



**Everyone knows
SYSTAT is the most
comprehensive
statistics package
on the Mac.**

**Did you know
it is also the
easiest to use?**

SYSTAT[®]



While everyone else has complicated their stat packages, we have simplified. Every published Macintosh statistics review has stated that professionals have only one choice: SYSTAT. Now we have taken the mystery out of statistics.

Choose from universal symbols instead of technical words. **Find** help anytime for any statistical term or menu. **Move** freely between statistics and graphics with Hypertext hot links. **Hear** optional sound feedback designed by human factors experts. **Import** data faster than any other major Mac stat package. **Analyze** data with crosstabs, regression, ANOVA, MANOVA, discriminant, ARIMA, Fourier, exponential smoothing, factor, principal components, MDS, nonlinear regression, maximum likelihood estimation, cluster, and much more. **Edit** reports with page preview, graphic and text annotation. **Explore** with 3-D rotation and color brushing. **Present** surfaces, interpolated and smoothed 3-D data clouds, math functions, scatterplot matrices, contours, stem-and-leaf, box, and probability plots, polar, bar, pie, line graphs, geographic maps, and much more. **Connect** Macintoshes, PC's, minis, and mainframes, exclusively with SYSTAT. **Succeed** with the only package offering a *complete* solution to your statistical problems. **It's that easy.**



SYSTAT. Intelligent software for statistics and graphics.

For more information call or write SYSTAT, Inc. 1800 Sherman Avenue, Evanston, Illinois 60201-3793 Tel: 708.864.5670 Fax: 708.492.3567
For international representatives call: **Australia** 61.3.4974755, **Canada** 416.424.1700, **Finland** 358.0.6923800, **France** 33.1.40935000,
Germany 49.30.310423, **Italy** 39.587.213640, **Japan** 81.3.5902311, **New Zealand** 64.71.562675, **Norway** 47.3.892240, **Sweden** 46.8.110620,
Switzerland 41.31.416611, **The Netherlands** 31.3402.66336, **UK:** Letchworth 44.462.482822, London 44.81.6926636

Circle 491 on reader service card

Verbatim

AN INTERVIEW WITH JAMES VON EHR, PRESIDENT AND CEO OF ALTSYS CORPORATION

BY JERRY BORRELL

James Von Ehr is co-founder, with Kevin Crowder, of Altsys Corporation. The Plano, Texas-based company develops and publishes *Fontastic*, *Fontographer*, *The Art Importer*, and *Metamorphosis*. In addition, Altsys developed *FreeHand*, published by Aldus Corporation. Begun in 1984, Altsys is now a company of 26 employees and \$3 million in annual revenues. Before founding Altsys, Von Ehr worked at Texas Instruments for more than a decade. He has a B.S. degree in computer science from the University of Michigan and an M.S. degree in computer science from the University of Texas.

MW How did you begin working in the computer field?

VON EHR In 1973 after finishing school in Michigan, my girlfriend and I drove to Dallas in my Volkswagen bus to interview at Texas Instruments. We camped out the night before the interview, and she cut my long hair so that I'd look respectable. They must have liked me, because they made me an offer during the interview. The job was in the operating system group extending a FORTRAN compiler. TI had just announced the first affordable mini-computer—it cost \$20,000. That excited me, and it seemed like a great place to work.

MW What was your first exposure to Apple computers?

VON EHR The hardware maintenance engineer at TI who serviced our computers convinced me that I should have an Apple II. So in 1978 I bought one. I had an interest in music and I

built a synthesizer to connect to it, with digital-to-analog converters and patch panels everywhere. I started going to college for my M.S. degree at about the same time.

I finished my M.S. in 1982, and by then I was really busy with my work and my projects. I was doing assembly programming on the Apple II, writing music programs. I had been appointed senior member of technical staff at TI, and they loaned us 99/4A computers. I did some game programming on the TI 99/4 home computer. TI published my program just before they got out of the personal computer business. I made enough royalties from the game to fund leaving the company in 1984.

MW Why did you leave?

VON EHR For a lot of the same reasons people leave big companies: the insecure, bad managers who will not let people grow, constant politics, unproductive meetings.

MW What happened in 1984?

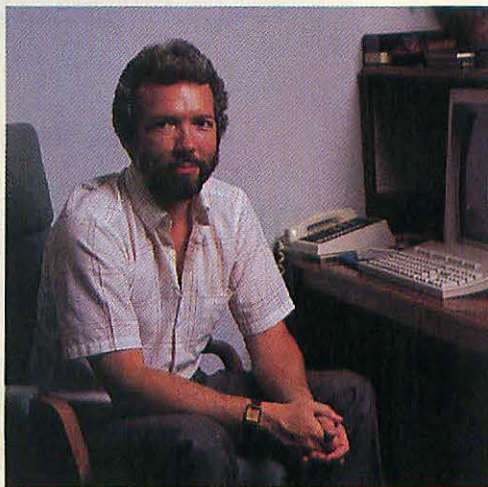
VON EHR In 1984 I did some consulting, wrote games for the Commodore 64 that were never finished, and bummed around. In early '84 the game market was collapsing.

MW How did you become involved in the Mac?

VON EHR At TI I had hired a summer intern, Kevin Crowder, who worked for me. He was going to go on to

graduate studies, but I convinced him to come work for me at TI. Kevin was the cofounder of Altsys.

We knew we wanted to work together and we kept trying to find something to do. We started a graphics presentation package on the IBM PC, like *Persuasion*. But the graphics performance of the PC was miserable. We liked the Mac but at that time it only had 128K of memory.



We thought about a CAD package, electrical CAD for PC-board layout on the Mac, but 128K of memory couldn't handle it. When the 512K Mac arrived we looked at it more seriously, but it still wasn't enough for CAD. Then Kevin had the idea of becoming a utility company.

MW Were there other utilities then for the Mac?

VON EHR Not really. At most there was clip art.

(continues)



Buy our Mac-compatible color printer and get this IBM-compatible color printer free.

Introducing the new Phaser PX Color Printer from Tektronix. It's the first color printer you can hook up to Macs, PCs and workstations. At the same time. And for a mere \$7995, you'll get all the features you could possibly want. Like PostScript-language compatibility. Brilliant thermal-wax color at 300 dpi. And certified PANTONE®* Color. No other printer offers so much for so little.

Call 1-800-835-6100, Dept. 11C to find out more about the new Tektronix Phaser PX—the color printer anyone can use.

The New **Tektronix Phaser PX***

*Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. Phaser is a trademark of Tektronix, Inc. Copyright © 1990 Tektronix, Inc. All rights reserved.

MW How did you decide what to do?

VON EHR Kevin said let's do a font editor, there is no decent product for that. So we did Fontastic. We thought about it for two weeks. And on December 14 of 1984 we said yes. We went to our lawyer and incorporated, and bought a 512K Mac. We drove to Megamax, the people who wrote a C compiler for the Mac, and bought that, and started programming. We had to learn C and Mac programming. I signed us up as Apple developers so we had a copy of the draft of *Inside Macintosh*.

It was obvious to us that this was a serious computer; the manner in which it handled events and the managers were all like a real computer operating system. I have a lot of respect for the original guys who did that work. They had a lot of vision. And I have to pat the current guys on the back for keeping that vision going while keeping the operating system compatible.

MW How long did it take to write your first program for the Mac?

VON EHR From start to finish the program took three months. After that, we agreed the Mac was the hardest machine we had ever programmed for. That product was Fontastic. It had 5000 lines of code and cost \$39.95. It took up 40K on a disk.

MW When did you begin shipping?

VON EHR April of 1985. We placed our first ad in *Macworld*. I made it up, it looked terrible. I signed a personal guarantee with *Macworld* that I'd pay for the ad. Two days after it appeared we began to get calls. It was disappointing how the business built up. There were no mailbags of orders at the post office like you have a vision of as a small developer. Instead there was one letter one day, two or three on another, and none sometimes.

Then slowly the business built up. Fontastic was not very stable in those days; nothing was very stable then. I suspect that the Mac toolbox was not too stable. We fixed the bugs as we learned about them. We had a lot of experience at fixing bugs and with

Circle 143 on reader service card.

quality service at Texas Instruments.

Just before we shipped 2.0 we got calls asking if the product worked with LaserWriter fonts. We told people that the fonts would print on the LaserWriter but that they wouldn't like them because they were bitmapped.

MW That presented you with your next business opportunity?

VON EHR Yes. We started to work on Fontographer in June of 1985. It was for object-oriented graphics. It draws outlines of characters, not turning dots on and off like a paint program.

We demonstrated Fontographer at the first Macworld Expo in Boston, in 1985. People had lots of comments about various aspects of the program. How to achieve tangent joins, smoothing curves, and straight lines. We went back after the show and eventually totally rewrote the interface. That set us back one month. In January of 1986 we shipped the first Fontographer. We took the product to the January Macworld Expo and sales there paid for our attending the show.

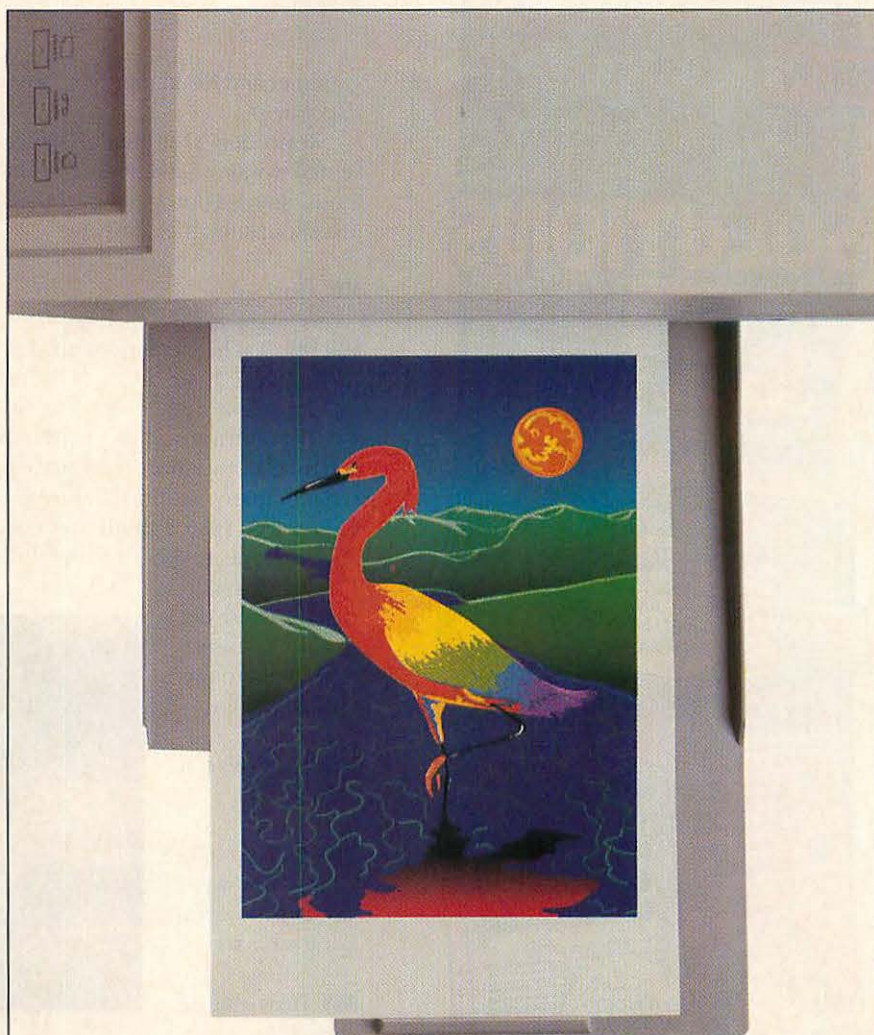
MW What happened with Fontastic?

VON EHR By January of 1986 we reached a peak of 800 units sold per month. It made us happy. We came out with Fontastic Plus in 1987. People still do bitmap editing with it. There are probably 18,000 copies of the program out there.

By May of 1986 the success of Fontographer allowed us to move out of my house and into a real office. Fontographer cost \$395. We had learned about distribution of software, learned about pricing of software, that it doesn't just reflect the cost of development. We learned that developers don't get much of the money that is made from development of software.

MW How did FreeHand come about?

VON EHR Our Fontographer customers told us they wanted a PostScript drawing program. We had one in Fontographer but it was limited. So we got started on a much less limited program. We started in February of 1986 but with me as the only full-time pro-
(continues)



Buy our IBM-compatible color printer and get this Mac-compatible color printer free.

Introducing the new Phaser PX Color Printer from Tektronix. It's the first color printer you can hook up to PCs, Macs and workstations. At the same time. And for a mere \$7995, you'll get all the features you could possibly want. Like PostScript-language compatibility. Brilliant thermal-wax color at 300 dpi. And certified PANTONE®* Color. No other printer offers so much for so little.

Call 1-800-835-6100, Dept. 11C to find out more about the new Tektronix Phaser PX—the color printer anyone can use.

The New Tektronix Phaser PX®

*Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. Phaser is a trademark of Tektronix, Inc. Copyright © 1990 Tektronix, Inc. All rights reserved.

Circle 9 on reader service card.

Save a Smart Bundle with our

NEW SMART SYSTEMS SOLUTIONS

Mac IIcx
\$3288
CPU price when purchased with system described

The IICX SYSTEM
• Huge 170 MB Internal H/Drive
• 8MBs of 80NS Ram
• 105 Extended Keyboard with Tempo II software
• TI PostScript laser printer
• 16" Sony color monitor, color card
• Fax and Modem!
PACKAGE SPECIAL ONLY \$9488
Business lease only \$340.82 per month with just \$481.24 down

A BUSINESS LEASE COULD BE AN INTELLIGENT ALTERNATIVE

The SE30 SYSTEM
• Generous 105 MB Internal H/Drive
• 5MBs of fast Ram
• 105 Extended Keyboard & Tempo II software
• HP DeskWriter printer
OUR PACKAGE PRICE ONLY \$5088
Business lease only \$182.66 per month with just \$1047.42 down

SE 30
\$2788
CPU price when purchased with system described

OUR 2YR EXTENDED WARRANTY MAKES GOOD SENSE!

Mac IIci
\$4488
CPU price when purchased with system described

The IICI SYSTEM
• Enormous 200 MB Internal H/Drive
• 8MBs of 80NS Ram
• 105 Extended Keyboard & Tempo II software
• QMS 810 PostScript laser printer
• 16" Sony color monitor, color card
• Fax and Modem!
PACKAGE SPECIAL ONLY \$14588
Business lease only \$523.71 per month with just \$1047.42 down

COMPARE THE OTHERS... THEN CALL YOUR MAC SYSTEM SPECIALISTS!

Mac Friends

800 331-1322
...or use our QUICKFAX (503) 255-0067
Call for America's Best Lease Rates!

CONSIDER OUR IMPORTANT ADVANTAGES:
1. LOW PRICE: compare the others, then call us!
2. KNOW-HOW: We're the nation's Macintosh system specialists.
3. SERVICE: Our exclusive Quick-Kare guarantees replacement overnight!
4. FAST DELIVERY: Overnight. To your door. Ready to boot!

grammer and Kevin part-time, we had to get help.

Kevin quit TI in July of 1986 and started working full-time on FreeHand. I was doing Fontographer 2.0. That just about sunk the company.

MW How so?

VON EHR We had preannounced Fontographer 2.0, so sales of 1.0 dried up. I was doing 80-hour weeks to finish up Fontographer, which was the basis of the short-term success of the company. It finally shipped in October of 1986. I think that helped earn us the respect of the industry; it showed that we cared, did quality software, and talked to our customers.

MW How was it received?

VON EHR Really well. Sales went up and the company was saved.

MW How did Aldus end up publishing FreeHand?

VON EHR As we were going along I realized what a big marketing project that product was. I realized we needed a bigger partner to make the most of the project.

We talked to Letraset and got serious with them. Then our Australian distributor found out what we were doing. Woolfe Hershberg at Infomagic in Australia called Aldus president Paul Brainerd, who was in Germany, and told him about our program—and told him that we were about to sell the rights to someone else. The next week I was at Aldus.

Kevin and I agonized for six weeks deciding who to go with. In retrospect, going to a big company was the right thing to do. People ask us "Don't you wish that you had the rights?" and "Don't you feel bad that Aldus gets

most of the money from the program while you just get a royalty?" But I'm not so sad. We couldn't have marketed that program ourselves back then so I'm okay with that decision.

MW You're still working on FreeHand?

VON EHR Yes, most of us at the company are working on the next version of FreeHand.

MW How did you advance from Fontographer to Metamorphosis?

VON EHR Our customers said they didn't want to draw existing artwork

over again. In Fontographer we ask them to draw the font or logo. If they already have these in some format, they don't want to redraw them. You could do that in Fontographer, but it takes a lot of work so we came up with the idea of KeyMaster.

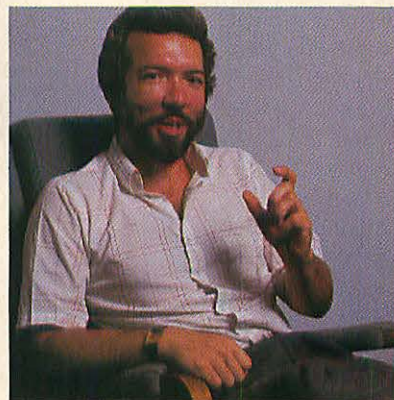


Illustration software is too hard-edged, too dull. The future is in better-integrated textures, to give more human feeling.

MW What was that idea?

VON EHR To take any picture in any format EPS or PICT file and crack that file, understand it, and have the com-

puter write a PostScript font program to describe the object. The Art Importer [originally KeyMaster] imports a file and does that.

MW Why the change of name?

VON EHR KeyMaster became a trademark problem.

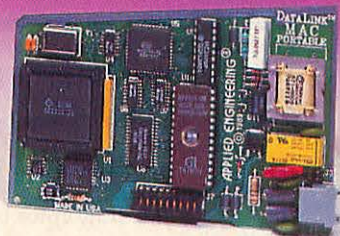
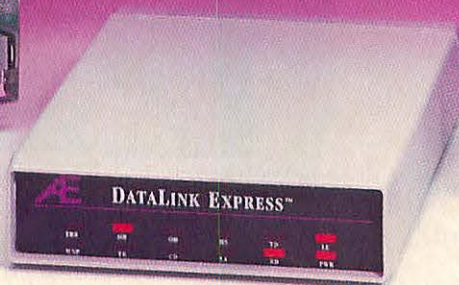
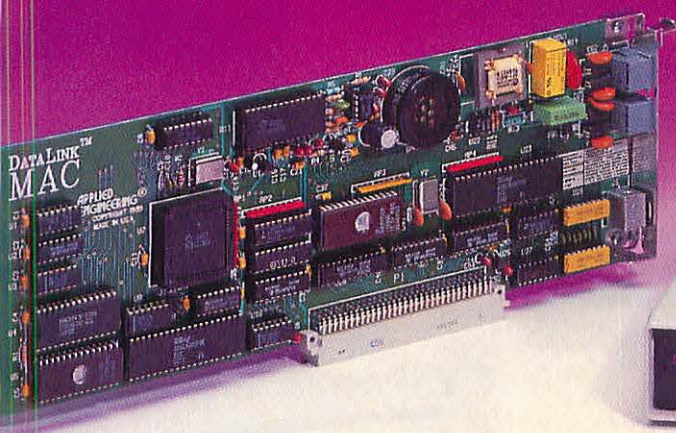
MW What is Metamorphosis?

VON EHR Since we made Fontographer, people have wanted to import and manipulate PostScript Type 1 fonts, make display type, change the curl on the

(continues)

Circle 434 on reader service card.

Check the fax. You'll choose a DataLink™



Combine the raw power of your Macintosh with the utility of a modem and the indispensable convenience of a fax machine — and you've got a DataLink Send-Fax™ modem from Applied Engineering

Send faxes directly from your Mac's screen without ever printing a "hard copy" of the information. The exclusive AE Send-Fax™ software installs itself in your Mac's Chooser DA. Faxes can then be sent as simply as printing. Imagine not having to waste time waiting around the fax machine to see if your faxes got through. Go right back to what you were doing, while AE Send-Fax™ operates in the background. You'll automatically receive a report when the fax is completed.

Compile your own fax-number Phonebook for instantaneous dialing. Customize your own cover sheet with your favorite clip art or drawing program. Preview your faxes by simply double-clicking their titles. Even program AE Send-Fax™ to send an entire distribution list from your Phonebook entries.

Tell AE Send-Fax™ to send your faxes and lengthy distribution lists late at night, when phone rates are least expensive and you're least likely to encounter busy signals. The next day, you'll be presented with a report confirming your faxes were received. You can even preset the number of retries

for individual numbers, for distribution lists or for the entire Phonebook.

Best of all, AE Send-Fax™ comes with the best modems you can buy — the DataLink™ series. 2400 bps modems that deliver unparalleled reliability, futuristic capabilities and unmatched technical excellence. Modems designed exclusively for the Macintosh, not "ported over" from another platform.

The result? Standard features like complete communications software included free, full Hayes AT compatibility, asynchronous data format, auto answer, non-volatile memory, automatic tone and pulse dialing, remote access, built-in diagnostics, FCC certified designs, free tech support, five year warranties and more. And upgradeability to MNP-5 with

4800 bps throughput speeds and error-free data transfer.

DataLink/Mac™ (left) for the Mac II series, includes an extra serial port so you can add a peripheral, even when the built-in ports are occupied. **DataLink Express™** (center) works externally with all Macintoshes and features another AE exclusive, our "Line Engaged" indicator to show a shared line is in use. Since DataLink Express works with all computers (w/serial port), we included both mini-8 and DB-25 ports. **DataLink/Mac Portable™** (right) includes AE Send-Fax™ and MNP-5 as standard features and incorporates an ultra-low power design to extend the Mac Portable's battery life.

Order today! To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm, 7 days. Or send check or money order to Applied Engineering, MasterCard, VISA and C.O.D. welcome. Texas residents add 7 1/4% sales tax. Add \$10 outside USA.

AE
Applied Engineering®
The enhancement experts.
A Division of AE Research Corporation

(214) 241-6060

P.O. Box 5100
Carrollton, TX 75011

Made
★IN THE★
USA

DataLink/Mac	\$299
DataLink/Mac with MNP-5	\$349
DataLink Express	\$249
DataLink Express with MNP-5	\$299
DataLink/Mac Portable	\$299
MNP-5 Option*	\$79
AE Send-Fax™ Option	\$79

*When not originally purchased with modem.

Circle 50 on reader service card

MacAvenue™

A Division of CompuAdd Corporation

Price...Performance

Get the Competitive Edge

Monitors/Cards

Why settle for monochrome? Now, MacAvenue lets you take hold of some screaming colors and create bright visuals that will grab attention. Combine the Seiko 14-inch Sony Trinitron monitor and the RasterOps 8-bit or 24-bit color card, and you'll have colors that are 43% brighter than the Apple color monitor.

Complete 8-bit color system.

22005 - \$930

Complete 24-bit color system.

22001 - \$1160

Seiko 14-inch color monitor.

22002 - \$595

RasterOps 208 8-bit color board.

23538 - \$365

RasterOps 264 24-bit color board.

23531 - \$595

RasterOps 264/SE30 color board.

23539 - \$745

RasterOps 364 color board. 23540 - \$1495



Spectacular Deal On Color Spectacular



First Adobe® PostScript® Laser Printer For Under \$2500!

Printers

A microLaser With MACRO applications

The microLaser is a remarkable Macintosh-compatible PostScript printer that is compact, user-friendly, upgradeable and affordable. Featuring a complete package of Adobe PostScript and HP LaserJet™ Series II emulations, the microLaser PS prints at 300x300dpi and flaunts 11 PostScript font

families with a total of 35 different fonts — all in an infinite array of point sizes. And, at just over a foot square, the microLaser fits neatly on your desk. If you want a really high-powered machine, enhance the standard 1.5MB RAM by adding memory boards — up to 4.5MB. The microLaser is

AppleTalk-ready and compatible with the Centronics® parallel interface.

microLaser PS. 22851 - \$2425

Envelope Feeder. 38712 - \$299

Second Paper Drawer. 38713 - \$325

TI microLaser RAM upgrade.

38563 - \$399

Why Buy From MacAvenue?

That's easy. Price. Service. Personality. And MacAvenue's Stress-Free Guarantee!

1 30-Day Money-Back Guarantee

Every hardware product and every office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes, and shipping costs are not refundable.

2 Toll-Free Technical Support • 90-Day Product Replacement

Should you experience a problem with anything you purchase from MacAvenue, call our product support staff at 800-766-6221 weekdays from 8:00am to 7:00pm, CST. We will be happy to assist you with any hardware or software difficulty. If we cannot resolve the problem over the phone, we'll assign you a return material authorization (RMA) number and a Federal Express number. We will replace the product with equivalent merchandise and pay the shipping both ways.

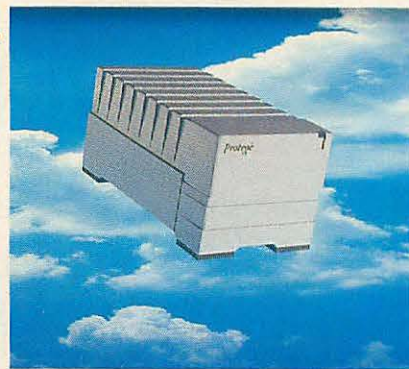
3 One-Year Limited Warranty

For up to one full year after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product you are not completely satisfied with, and we will pay for return freight to you.

Drives

The Protégé from MacAvenue is everything you'd expect from the best drive in the business: quiet, cool, quick, elegantly engineered, tough enough to travel and priced to move. It arrives pre-formatted with custom-designed Disk Management Software that allows you to partition your drive and password protect each partition. Smart features include external termination and push-button SCSI ID setting.

The Protégé is bundled with **On Location**, the popular file-finding utility, a \$129.95 value.



Capacity	External		Internal	
	Seagate	Quantum	Seagate	Quantum
20+MB	\$345	N/A	\$295	N/A
40+MB	\$395	\$455	\$325	\$375
80+MB	\$525	\$645	\$465	\$595
100+MB	\$649	\$695	\$575	\$645

MacAvenue is a trademark and CompuAdd is a registered trademark of CompuAdd Corporation. Mac, Macintosh, HyperCard, and Apple are registered trademarks of Apple Computer, Inc. All other trademarks are the property of their respective companies. All return items must be accompanied by a return merchandise authorization (RMA) number. Prices and product descriptions are subject to change without notice. Neither CompuAdd nor MacAvenue is liable for damage due to omissions or typographical errors.



The Best Prices on the Best Mac Products

Tear out this price list — Compare MacAvenue's prices — We give you the competitive edge.

Business Software

Spreadsheet Programs & Templates	
30180 Excel 2.2 (Microsoft)	\$245
30186 Full Impact (Ashion-Tate)	\$245
30580 Microsoft Works (Microsoft)	\$177
30184 Wingz (Informix)	\$245
28476 101 Macros for Excel (Individual Software)	\$35

Communications

On the Modem	
27708 Carbon Copy Mac (Microcom)	\$119
27702 CompuServe Info Serv (CompuServe)	\$23
27704 CompuServe Navigator (CompuServe)	\$38
27706 Connect (Connect)	\$93
27672 Desktop Express (Dow Jones)	\$94
27710 LapLink 3.0 (Traveling Software)	\$112
27660 Microphone II (Software Ventures)	\$213
30580 Microsoft Works (Microsoft)	\$177
27670 News/Retrieval+ Membership (Dow Jones)	\$23
27662 SmartCom II (Hayes)	\$84
27668 Timbuktu Remote (Farallon)	\$123
27664 White Knight (Freesoft)	\$89

On the Network

27700 In/Out 10 User (CE Software)	\$187
27698 In/Out 5 User (CE Software)	\$125
27690 InBox Connection (Tops)	\$41
27688 InBox Starter (Tops)	\$143
27680 MS Mail 2.0 Pack (Microsoft)	\$959
27678 MS Mail Server (Microsoft)	\$246
27676 MS Mail Workstation (Microsoft)	\$83
27686 NetPrint v. 2.0 (Tops)	\$115
27696 Quickmail 10 Pack (CE Software)	\$313
27695 Quickmail 5 User v2.2 (CE Software)	\$210
27692 Quickmail Remote (CE Software)	\$31
27666 Timbuktu 3.0 (Farallon)	\$95
27674 TrafficWatch (Farallon)	\$127

Education & Entertainment

On the Learning Curve	
27948 Animal Kingdom (Unicorn)	\$26
27956 Atlas Explorer (Springboard)	\$27
27964 Calculus (Broderbund Software)	\$57
27976 Dinosaur Discovery Kit (First Byte)	\$26
27982 First Shape (First Byte)	\$31
27962 Geometry (Broderbund Software)	\$57
27990 KidsMath (Great Wave)	\$25
27988 KidsTime (Great Wave)	\$24
27952 MacRobots (Unicorn)	\$26
27968 Math Blaster! (Davidson & Associates)	\$26
27970 Math Blaster Mystery (Davidson & Assoc.)	\$26
27950 Math Wizard (Unicorn)	\$26
27992 NumberMaze (Great Wave)	\$25
27966 Physics (Broderbund Software)	\$57
27974 Puzzle Storybook (First Byte)	\$26
27954 Read-A-Rama (Unicorn)	\$31
28000 Reader Rabbit (Learning Company)	\$30
27972 Speed Reader II (Davidson & Associates)	\$29
27984 Speller Bee (First Byte)	\$31
28002 Talking Math Rabbit (Learning Company)	\$30
27986 TimeMasters (Great Wave)	\$21
27958 Type! (Broderbund Software)	\$18
28014 Typing Instructor Encore (Individual Soft.)	\$15
28008 Typing Tutor (Simon & Schuster)	\$28
28004 Voyager (Carina Software)	\$87

Just for the Fun of It (Games)

28692 4th and Inches (Accolade)	\$26
28668 Ancient Art of War (Broderbund)	\$25
28670 Ancient Art of War at Sea (Broderbund)	\$25
28648 Apache Strike (Electronic Arts)	\$31
28632 Balance of Power 1990 (Mindscape)	\$29
28654 Bard's Tale (Electronic Arts)	\$30
28646 Beyond Dark Castle (Silicon Beach)	\$31
28738 Bomber (In-Line Design)	\$25
28656 Chuck Yeager Flight Sm (Electronic Arts)	\$30
28634 Colony (Mindscape)	\$28
28700 Cosmic Osmo (Mindscape)	\$40
28638 Crossword Magic (Mindscape)	\$28
28704 Crystal Quest 2.2T (Casady & Greene)	\$24
28706 Crystal Quest 2.2T w/edit (Casady & Greene)	\$39
28650 Dark Castle (Silicon Beach)	\$31
28636 Deja Vu II (Mindscape)	\$28
28614 Falcon (Spectrum Holobyte)	\$30
28684 Ferrari Grand Prix (Bullseye)	\$32
28682 Fokker Tri-plane (Bullseye)	\$23
28612 GATO (Spectrum Holobyte)	\$25
28642 Gauntlet (Mindscape)	\$28
28688 Hardball (Accolade)	\$25
28618 Hidden Agenda (Springboard)	\$35
28620 JET (SubLogic)	\$31
28724 Kings Quest 1 (Sierra-On Line)	\$28
28726 Kings Quest 2 (Sierra-On Line)	\$28
28728 Kings Quest 3 (Sierra-On Line)	\$28
28714 Leisure Suit Larry 1 (Sierra-On Line)	\$23
28658 Life & Death (Electronic Arts)	\$31
28624 Lunar Rescue (XOR)	\$32
28730 Mac Wizardry (Sir-Tech)	\$34
28708 MacGolf (PCAI)	\$33
28628 MacGolf Classic (XOR)	\$51
28722 Man Hunter NY (Sierra-On Line)	\$28
28696 Manhole (Activision)	\$28

Just for the Fun of It (Games) (continued)

28698 Manhole (CD ROM) (Activision)	\$34
28690 Mean 18 (Accolade)	\$25
28630 NFL Challenge (XOR)	\$53
28686 P51 Flight Simulator (Bullseye)	\$32
28720 Police Quest I (Sierra-On Line)	\$28
28610 PT-109 (Spectrum Holobyte)	\$25
28694 Quarterstaff (Activision)	\$30
28652 Reach for the Stars (Electronic Arts)	\$25
28626 Road Racer (XOR)	\$39
28616 Sargon IV (Spinnaker)	\$29
28640 Shadowgate (Mindscape)	\$28
28666 Shufflepuck Cafe (Broderbund)	\$22
28678 SimCity (Broderbund)	\$28
28680 SimCity Supreme (Broderbund)	\$47
28710 SpaceQuest (Sierra-On Line)	\$28
28712 SpaceQuest II (Sierra-On Line)	\$28
28664 Star Wars (Broderbund)	\$23
28622 TaskMaker (XOR)	\$26
28606 Tetris (Spectrum Holobyte)	\$18
28608 Tetris (Color Version) (Spectrum Holobyte)	\$21
28660 Hunt for Red October (Software Toolworks)	\$31
28644 Uninvited (Mindscape)	\$28
28604 Welltris (Spectrum Holobyte)	\$18
28672 Where? Carmen Sandiego (Broderbund)	\$28
28674 Where/Europe Carmen (Broderbund)	\$28
28676 Where/USA Carmen (Broderbund)	\$28
28662 Starfleet (Electronic Arts)	\$35

Music & Sound

27998 ConcertWare + MIDI (Great Wave)	\$98
27960 Jam Session (Broderbund)	\$29
27978 SmoothTalker (First Byte)	\$31

The Graphic Arts

Mostly Drawing	
29232 Canvas (Deneba Software)	\$186
29206 ClarisCAD 1.0 (Claris)	\$589
29234 Cricket Draw (Cricket)	\$169
29238 Dreams 1.1 (Innovative Data Design)	\$315
29784 Freehand 2.0 (Aldus)	\$326
29788 Illustrator 88 (Adobe)	\$275
29240 MacDraw II (Innovative Data Design)	\$167
29204 MacDraw II 1.1 w/ ATM (Claris)	\$291
29222 SuperPaint (Silicon Beach)	\$124
Mostly Painting	
29236 Cricket Paint (Cricket)	\$176
29202 MacPaint II 2.0 (Claris)	\$94
29228 PixelPaint (Supermac)	\$223
29230 PixelPaint Pro (Supermac)	\$387
Mostly Graphics Editing	
29224 Digital Darkroom (Silicon Beach)	\$260
29790 ImageStudio (Letraset)	\$273
29218 Model Shop (Paracomp)	\$378
29242 Photoshop (Adobe)	\$498
29244 Studio/1 (Electronic Arts)	\$95
29244 Studio/8 (Electronic Arts)	\$295
29226 Super3D (Silicon Beach)	\$313
29220 Swivel 3D (Paracomp)	\$294
29212 Videoworks II Accelerator (Macromind)	\$119
29210 Videoworks II Hypercard (Macromind)	\$60

Graph & Chart Makers

29806 Cricket Graph 1.3 (Cricket)	\$113
29260 DeltaGraph (DeltaPoint)	\$97

Presentation Managers

29258 Accelerator (Macromind)	\$124
29804 Cricket Presents 2.0 (Cricket)	\$283
29216 Director (Macromind)	\$436
29782 Persuasion (Aldus)	\$327
29798 PowerPoint 2.01 (Microsoft)	\$246

Certificate & Award Generators

29810 Certificate Library (Springboard)	\$17
29808 Certificate Maker (Springboard)	\$21
29812 Top Honors (Springboard)	\$57

Graphic Utilities, etc.

29794 LetraStudio (Letraset)	\$273
29264 Curator (Solutions Int'l)	\$71
30380 SmartScrap & Clipper (Solutions Int'l)	\$45

Graphic Art Collections

29252 Click Art Business (T-Maker)	\$32
29256 Click Art Christian (T-Maker)	\$37
29254 Click Art Holidays (T-Maker)	\$32
29818 EPS Business Art (T-Maker)	\$82
29816 EPS Illustrations (T-Maker)	\$83
29246 Smart Art 1 (Emerald City)	\$83
29248 Smart Art 2 (Emerald City)	\$83
29250 Smart Art 3 (Emerald City)	\$83

Optical Character Recognition

30610 OmniPage 2.0 (Caere)	\$535
----------------------------	-------

Do It Yourself Programming

30426 101 Scripts & Buttons (Individual Software)	\$35
27582 Just Enough Pascal (Syntec)	\$46
27588 Prototypor (Smethers Barnes)	\$183
27590 QuickBasic (MicroSoft)	\$64
27580 Supercard (Silicon Beach)	\$127
27586 THINK C (Syntec)	\$163
27584 THINK Pascal v3.0 (Syntec)	\$160
30416 TMON (Icom Simulation)	\$87
27592 Turbo Pascal (Borland)	\$67

Safety, Maintenance & Repair Utilities

Data Organization	
30354 DiskTop 4.0 (CE Software)	\$63
30434 On Location (On Technologies)	\$75
30402 Suitcase II (Fifth Generation)	\$43

Data Storage Management & Repair

30420 Complete Undelete (1st Aid Software)	\$36
30362 Copy II Mac (Central Point)	\$22
30410 Disk Tools Plus (Electronic Arts)	\$31
30422 DiskExpress II 2.0 (ALSOFT)	\$54
30392 DiskFit (SuperMac Software)	\$58
30404 FastBack (Fifth Generation)	\$106
30374 INITPicker (Microseeds Publishing)	\$26
30364 Mac Tools 1.0 (Central Point)	\$43
30394 Network DiskFit (SuperMac Software)	\$223
30436 Norton Util for the Mac (Norton Utilities)	\$79
30378 Redux (Microseeds Publishing)	\$51
30384 Retrospect (Dantz Development)	\$152
30340 Sum II (Syntec)	\$92
30344 XTree Mac (Xtree)	\$52

Time Saving Utilities

30348 CanOpener (Abbott Systems)	\$63
30430 Clip Share 1.0 (Olduvai)	\$138
30388 LaserSpool (SuperMac)	\$87
30390 LaserSpool 5-Pack (SuperMac)	\$286
30428 MacPrint 1.1 (Insight Development)	\$94
30360 MockPackage Plus Util. (CE Software)	\$30
30408 On Cue (Icom Simulations)	\$35
30400 PowerStation (Fifth Generation)	\$33
30356 QuickKeys (CE Software)	\$62
30418 Shortcut (Alladin)	\$45
30382 SuperGlue (Solutions Int'l)	\$61
30386 SuperSpool (SuperMac)	\$58
30352 Tempo II (Affinity Microsystems)	\$97

Data Security Utilities

30406 DiskLock (Fifth Generation)	\$106
30370 MacSafe II (Kent marsh LTD)	\$105
30366 QuickLock v1.0 (Kent marsh LTD)	\$55
30396 Sentinel (Supermac)	\$86
30368 The Night Watch v1.03 (Kent marsh LTD)	\$85

Screen Saver Utilities

30424 After Dark (Berkley Systems)	\$24
30399 Pyro (Fifth Generation)	\$21

Virus Detectors & Eradicators

30342 SAM (Syntec)	\$63
30412 Virex (HJC Software)	\$51
30414 Virex (10 Pack) (HJC Software)	\$346

Other Utilities

30350 Affinifile (Affinity Microsystems)	\$44
30376 Screen Gems (Microseeds Publishing)	\$39



Call for FREE
catalog!

800-388-6221

Key Code
9523

MacAvenue
A Division of CompuAdd Corporation

12303 Technology Boulevard,
Austin, Texas 78727

MacAvenue is a trademark and CompuAdd is a registered trademark of CompuAdd Corporation. Mac, Macintosh, HyperCard, and Apple are registered trademarks of Apple Computer, Inc. All other trademarks are the property of their respective companies. All return items must be accompanied by a return merchandise authorization (RMA) number. Prices and product descriptions are subject to change without notice. Neither CompuAdd nor MacAvenue is liable for damage due to omissions or typographical errors.



The Best Prices on the Best Mac Products

Tear out this price list — Compare MacAvenue's prices — We give you the competitive edge.

Hardware

Storage Device	
24731 800K Floppy Drive (Fujitsu)	\$145
24730 2.4M Floppy Drive (Kenneth Technologies)	\$325
24732 DaynaFile 5.25" 1.2MB Floppy	\$550
24733 DaynaFile 5.25" 360K/1.2MB	\$725
24930 Rapport Disk Drive (Kenneth Technologies)	\$195
24380 20MB Ext. HD (Protege)	\$345
24386 20MB Ext. HD (Cutting Edge)	\$335
24381 40MB Ext. HD (Protege)	\$395
24387 40MB Ext. HD (Cutting Edge)	\$430
24390 40MB Ext. Qm. HD (Protege)	\$455
24382 80MB Ext. HD (Protege)	\$525
24388 80MB Ext. HD (Cutting Edge)	\$579
24391 80MB Qm. HD (Protege)	\$645
24383 100MB Ext. HD (Protege)	\$649
24389 100MB Ext. HD (Cutting Edge)	\$779
24392 105MB Ext. Qm. HD (Protege)	\$695
24180 20MB Int. HD - SE (CompuAdd)	\$295
24184 20MB Int. HD - Mac II (CompuAdd)	\$295
24181 40MB Int. HD - SE (CompuAdd)	\$325
24185 40MB Int. HD - Mac II (CompuAdd)	\$325
24182 80MB Int. HD - SE (CompuAdd)	\$465
24186 80MB Int. HD - Mac II (CompuAdd)	\$465
24183 100MB Int. HD - SE (CompuAdd)	\$575
24187 100MB Int. HD - Mac II (CompuAdd)	\$575
24384 Bernoulli 40-40 (IOmega)	\$2,799
24385 Portable 44MB (IOmega)	\$1,850
23830 QT-40 40MB Tape Sys (Tecomar)	\$950
23831 QT-80 80MB Tape Sys (Tecomar)	\$1,225
24931 QT-40 Cable Kit (Tecomar)	\$106
26080 QT-80MB/2 Cart. (Tecomar)	\$85
57440 3.5" Diskettes 1.2MB 10PK (Sony)	\$29
57401 3.5" Diskettes 800KB 10PK (Sony)	\$15
41601 Teak 3.5" Double Rollup Box	\$29
41600 Teak 3.5" Single Diskette Box	\$20

Printers, Scanners & FAXes

56800 HP LaserJet Series II (Hewlett-Packard)	\$1,699
22851 MicroLaser PostScript w/ATK (Texas Inst.)	\$2,425
22850 DeskWriter Inkjet (Hewlett-Packard)	\$849
56339 LQ-2550 - 24 pin Prr. (Epson)	\$999
56340 LQ-510 - 24 pin Prr. (Epson)	\$339
56303 LX 810 - 9 pin Prr. (Epson)	\$195
22852 Label Printer (Seiko Inst.)	\$195
22752 Half-page Scanner (Complete PC)	\$313
22753 Page Scanner (Complete PC)	\$758
22758 Computer Eyes B/W Scan (Digital Vision)	\$196
22759 Computer Eyes Color (Digital Vision)	\$344
22750 HP Scanjet w/ interface (Hewlett-Packard)	\$1,689
22755 300Z Color Scanner (MicroTek-IMSI)	\$2,049
22756 MS-11 B&W Scan. (MicroTek-IMSI)	\$1,080
22757 ThunderScan Plus (Thunderware)	\$199
22751 ScanMan 32 (Logitech)	\$317
22701 DoveFax-Ext. (Dove)	\$270
22700 Relisys TeFAX RA2110 (Tefex)	\$1,295
26902 Labels for Seiko Label Printer (Seiko)	\$11.99
37713 Second Paper Drawer (Texas Inst.)	\$325
38712 Envelope Feeder (Texas Inst.)	\$299
38564 Laser: Appletalk Comm. Dk. 232 (Texas Inst.)	\$125
38563 Laser: 1MB memory Kit (Texas Inst.)	\$399
38311 Laser: Micro Toner Cartridge (Texas Inst.)	\$59

Communications - Modem

49525 Modem: 1200 Ext. w/o SW (CompuAdd)	\$89
49557 Modem: 2400 Ext w/o SW (CompuAdd)	\$129
22306 Modem: Datalink Express (Applied Eng.)	\$215
22308 Modem: Datalink Macport. (Applied Eng.)	\$299
22307 Modem: Datalink Mac (Applied Eng.)	\$325
49501 Modem: Smartmodem 1200 (Hayes)	\$299
49576 Modem: Smartmodem 2400 (Hayes)	\$385
49578 Modem: Smartmodem 9600 (Hayes)	\$895
22507 NetModem V2400 (Shiva)	\$435
22528 NetModem V.32 9600 baud (Shiva)	\$1,289
22309 MMPLS Protocol adapt. (Applied Eng.)	\$79
22310 Send Fax Adapter (Applied Eng.)	\$79

Communications - Network

22500 Modem Thick (Adaptec)	\$395
22527 Modem Thin (Adaptec)	\$395
22508 Ethergate (Shiva)	\$1,825
22510 FastPath 4 Gateway (Kinetics)	\$1,935
22509 Interbridge (Hayes)	\$645
22520 LocalTalk Conn. DB-9 (Interex)	\$32
22521 LocalTalk Conn. Din-8 (Interex)	\$32
22524 MacCon I/IE (Asanti)	\$395
22529 MacCon I/IE UTP (Asanti)	\$395
22530 MacCon SE30/E (Asanti)	\$395
22531 MacCon SE30/ETP (Asanti)	\$395
22526 MacCon SE30/TK (Asanti)	\$395
22533 MacCon SEE (Asanti)	\$295
22525 MacCon SEETK (Asanti)	\$295
22532 MacCon SEETP (Asanti)	\$292
22505 NetBridge (Shiva)	\$339
22504 NetSerial X232 (Shiva)	\$275
22511 PhoneNet Connector DB-9 (Farallon)	\$34
22513 PhoneNet Connector Din-8 (Farallon)	\$31
22517 PhoneNet Repeater (Farallon)	\$313
22515 PhoneNet Star Conn. 10 pk (Farallon)	\$138
22512 PhoneNet Star Connector (Farallon)	\$118
22516 PhoneNet Star Controller (Farallon)	\$888
22514 PhoneNet To Local. Adapt. (Farallon)	\$31
22534 PhonNetDin-8 10pk (Farallon)	\$215

Communications - Network (continued)

22519 Portable Pack (Farallon)	\$373
22518 Star Wiring Kit Harmonica (Farallon)	\$64
22506 TeleBridge (Shiva)	\$339

Monitors & Video Card

22006 19 Mon. w/Color Bd. 208 (Rasterops)	\$4,550
22008 L-View Multi. Mon. w/card (Sigma Designs)	\$1,495
22002 14" Color Monitor w/o card (Seiko Inst.)	\$595
22000 19 Colormax w/card (Sigma Designs)	\$4,999
22100 P.V. 15" Mon. w/ Mac II adptr. (Sigma Designs)	\$1,050
22101 P.V. 15" Mon. w/ SE adptr. (Sigma Designs)	\$999
22106 P.V. 15" Mon. w/ SE/30 adptr. (Sigma Designs)	\$1,050
22191 P.V. 15" Mon. w/o adptr. (Sigma Designs)	\$645
22005 14" Mon. w/Color Bd. 208 (Seiko/Rasterops)	\$930
22001 14" Mon. w/Color Bd. 264 (Seiko/Rasterops)	\$1,160
22103 S.V. 21" w/ SE/30 adptr. (Sigma Designs)	\$1,599
22104 S.V. 21" w/Mac II adptr. (Sigma Designs)	\$1,599
22107 S.V. 21" w/SE adptr. (Sigma Designs)	\$1,599
22190 S.V. 21" w/o adptr. (Sigma Designs)	\$1,095
22007 G530 Grey Scale 19" Mon. (Rasterops)	\$1,795
23538 Color Board 208 (Rasterops)	\$365
23531 Color Board 264 (Rasterops)	\$595
23539 Color Board 264/SE-30 (Rasterops)	\$745
23540 Color Board 364 (Rasterops)	\$1,495
23530 Multiscreen Card (Mobiux)	\$295

Accelerator & Expansion Boards

23632 Acc. 030 25mhz II w/co 6888 (DayStar)	\$1,149
23633 Acc. 030 33mhz II w/co 6888 (DayStar)	\$1,539
23638 Acc. 030 40mhz II w/co 68882 (DayStar)	\$1,919
23639 Acc. 030 50mhz II w/co 68882 (DayStar)	\$2,309
23644 Acc. 030 25mhz Ix w/co 68882 (DayStar)	\$1,149
23645 Acc. 030 33mhz Ix w/co 68882 (DayStar)	\$1,539
23646 Acc. 030 40mhz Ix w/co 68882 (DayStar)	\$1,919
23643 Acc. 030 50mhz Ix w/co 68882 (DayStar)	\$2,309
23647 Acc. 030 50mhz Ilex w/co 68882 (DayStar)	\$2,309
23640 Acc. 030 25mhz Ilex w/co 68882 (DayStar)	\$1,149
23641 Acc. 030 33mhz Ilex w/co 68882 (DayStar)	\$1,539
23642 Acc. 030 40mhz Ilex w/co 68882 (DayStar)	\$1,919
23636 Acc. Dove 33mhz SE-30 board (Dove)	\$445
23637 Acc. Dove SE 020 w/881 & 1MB (Dove)	\$777
23634 Acc. ILCI CACHE Card (DayStar)	\$754
23733 DigiVideo B/W Card (Aaps)	\$399
23735 DigiVideo Color Card (Aaps)	\$644
23731 MicroTV (Aapps)	\$275

Memory Expansion

25480 2 X 1MB SIMMS (80ns) (Technology Works)	\$150
25482 4 X 1MB SIMMS (80ns) (Technology Works)	\$300
25481 4 X 4MB SIMMS (80ns) (Technology Works)	\$1,900
25484 4 X 1MB SIMMS FX (Technology Works)	\$436
25483 4 X 1MB SIMMS NTX (Technology Works)	\$436

Keyboards, Mice, Etc.

25184 15 function key module (DataDesk)	\$37
25283 Little Mouse (Mouse Systems)	\$37
25180 Mac-101 Keyboard, ADB (DataDesk)	\$134
25181 Mac-101 Keyboard (beige) (DataDesk)	\$134
25282 Mobius Cordless Mouse (Mobius)	\$89
26885 Bit Pad Plus (Summagraphics)	\$318
25183 Switchball (DataDesk)	\$115
25182 Switchboard (DataDesk)	\$174
25284 Trackball ADB (Mouse Systems)	\$72
25280 Turbo Mouse Plus (Kensington)	\$107
25281 Turbo Mouse ADB (Kensington)	\$107

Power Supplies & Fans

26880 Fanny Mac (fan) (Mobiux)	\$58
26888 System Saver Fan Plus (Kensington)	\$62
26889 System Saver Fan SE (Kensington)	\$62
26293 Powerchute Ntwk UPS Software (A.P.C.)	\$99
26292 UPS, Uninterruptible supply (A.P.C.)	\$275

Sound Interfaces

23730 MacRecorder (Farallon)	\$162
23732 MIDI Interface (Passport Designs)	\$76

Accessories

41026 Data-Vac MDV-1 w/hose and acc.	\$49
41753 Keyboard drawer (CompuAdd)	\$19
41019 Kleen Keyboard Kit (CompuAdd)	\$10
26883 Anti-Glare Filter (platinum) (Kensington)	\$32
26882 Anti-Glare Filter (beige) (Kensington)	\$32
26891 Apple Color Mon. Pol. Filter (Kensington)	\$62
26886 HyperDialer (DataDesk)	\$32
26895 Imagewriter II Dust Cover (Cover-up)	\$8
26897 LaserWriter II Dust Cover (Kensington)	\$12
26898 Mac Carrying Case (Pace)	\$65
26901 Mac Carrying Case Ext. Bkd. (Pace)	\$76
26892 Mac II Stand & Cable Kit (Kensington)	\$63
26887 Mac II System Stand (Kensington)	\$20
26894 Mac Plus/SE Sys Saver Cover (Cover-up)	\$8
26893 Masterpiece Mac II (Kensington)	\$103
26896 Universal Printer Stand (Kensington)	\$15
25580 Mac II Monitor Stand (Kensington)	\$62
25582 Tilt/Swivel Stand (Kensington)	\$21
40510 Surge Suppressor (TrippLite)	\$29
26884 Security Kit (Kensington)	\$33
41752 Teak KB Drawer PSK 132 (CompuAdd)	\$72
26881 Tool kit: 3 pieces (Interex)	\$15
26903 The Library (grey)	\$12

Software

Writing & Publishing

Word Processing (Writing)	
30600 FullWrite Prof. (Ashton-Tate)	\$253
30586 MacWrite II 1.1 w/ ATM (Clariss)	\$157
30582 Microsoft Word (Microsoft)	\$245
30580 Microsoft Works (Microsoft)	\$177
30584 Microsoft Write (Microsoft)	\$77
30602 Nisus (Paragon Concepts)	\$236
30590 WordPerfect Mac 1.03.0 (WordPerfect)	\$227
30588 WriteNow (T/Maker)	\$116

Page Layout (Publishing)

29792 Letraset Ready-Set-Go (Letraset)	\$273
29781 Pagemaker (Aldus)	\$497
29822 Publish-it (Timeworks)	\$223
29802 Quark Xpress 2.11 (Quark)	\$445
29796 Silicon Press (Silicon Beach)	\$51
29814 Springboard Publisher (Springboard)	\$107

Utilities for Writers/Publishers

30606 Acla Advantage (Symmetry)	\$63
30618 Big Thesaurus 1.0 (Deneba Software)	\$63
30594 Findswell (Working Software)	\$35
30440 Letter Writer Plus (Power Up)	\$54
29820 MacMem (ICOM Simulations)	\$113
30604 More II (Symantec)	\$265
29786 PageMaker Color Ext. (Aldus)	\$133
29800 QuarkStyle 1.0 (Quark)	\$165
30598 QuickLetter (Working Software)	\$72
30622 WordFinder 2.0 (Microlytics)	\$31

Spelling Checkers

30620 Spelling Coach Pro 3.1 (Deneba Software)	\$112
30596 Spellswell (Working Software)	\$44

Fonts & Font Utilities

Adobe Fonts — All 134 available	CALL
30444 Freedom of Press (Custom Applications)	\$255
29824 Type Manager [ATM] (Adobe)	\$55
29828 Type Mgr/Type Align (Adobe)	\$88
29830 Type Reunion (Adobe)	\$38
29826 TypeAlign (Adobe)	\$58
29834 Plus Pak (Adobe)	\$107

Business Software

Integrated & Bundled Applications

30182 Microsoft Office Bundle (Microsoft)	\$525
30580 Microsoft Works (Microsoft)	\$177

Accounting/Bookkeeping

28481 Accountant Inc. Prof (Softsync)	\$348
28466 Business Sense (Monogram)	\$265
28468 Checkwriter II (Aatrix)	\$37
28464 Dollars & Sense (Monogram)	\$78
28474 Easy-Light (DAC)	\$41
28440 Insight Accounts Payable (Layered)	\$395
28442 Insight Accounts Receivable (Layered)	\$395
28454 Insight At Once (Layered)	\$283
28444 Insight General Ledger (Layered)	\$395
28446 Insight Inventory (Layered)	\$395
28448 Insight Payroll (Layered)	\$395
28450 Insight Time Bill (Layered)	\$395
28478 MacMoney 3.5 (Survivor Software)	\$58
28462 Managing Money (Meca)	\$122
28458 Quicken (Intuit)	\$35

Data Analysis & Presentation

28470 StatView II (Imac, SE, II) (Abacus Concepts)	\$278
28472 StatView SE + Graphics (Abacus Concepts)	\$199

Databases Management

27780 4th Dimension (Acus)	\$511
27782 4th Dimension Runtime (Acus)	\$85
27788 Claris Filemaker Pro (Clariss)	\$216
27800 dBASE Mac (Ashton-Tate)	\$379
27802 dBase Runtime (Ashton-Tate)	\$569
27804 Double Helix (Odessa)	\$369
27790 FoxBase II (Fox Software)	\$292
27796 FoxBase Multuser Runtime (Fox Software)	\$293
27794 FoxBase Multuser (Fox Software)	\$385
27798 Microsoft File (Microsoft)	\$123
27808 Panorama (ProVue)	\$246

Office Productivity Programs & Utilities

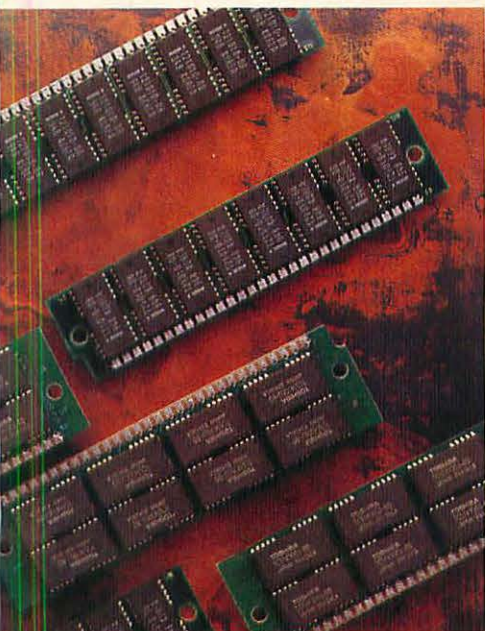
30442 Address book Plus (Power-up)	\$52
27812 BulkMailer 3.3 (Satori Software)	\$76
27814 BulkMailer Plus (Satori Software)	\$187
30432 Calendar Creator + Mac (Power Up Software)	\$36
30358 Calendar Maker (CE Software)	\$30
27818 DataDesk Prof. 3.0 (Odessa)	\$347
30438 Fast Forms 2.0 (Power-up)	\$116
30372 Kiwi Envelopes (Kiwi Software)	\$34
30440 Letter Writer Plus (Power Up)	\$54
27816 MailList (MySoftware)	\$27
27806 Milo (Paracom)	\$156
29200 Smartforms Designer (Clariss)	\$291

Time & Project Scheduling

29744 Fast Track Schedule (AEC)	\$108
27810 KeyPlan (Symmetry)	\$243
29740 MacProject II 2.1 (Clariss)	\$366

Personality...and Price

From Your Best Source for Macintosh Products



Boards/Memory

Build Your Memory

You need at least 4MB to run a couple of heavy-hitting applications with Multi-Finder. Take advantage of MacAvenue bargains to upgrade your Plus to 4MB or take your SE30 to 8 megs. MacAvenue offers only the best surface-mounted, 80-nanosecond memory products. And you'll get a step-by-step installation guide with a tool to "crack" the Mac Plus or SE. If you

want to speed up printing of complicated graphics and heavily formatted reports, beef up your printer's RAM as well.

2 x 1MB SIMMs. 25480 - \$150

4 x 1MB LaserWriter SIMMs.

25483 - \$436

4 x 1MB FX SIMMs. 25484 - \$436

4 x 4MB SIMMs. 25481 - \$1,900

Free with your 4 x 4 MB SIMM purchase — **NanoDisk** — lets you store up to 28MB of applications and files for fast retrieval. \$79.95 value.

Software



Edging Out the Jagged Edge

Forget those nasty jagged edges on the bit-mapped letters of your screen fonts. Adobe TypeManager gives you the look of PostScript type and it improves the output of your non-postscript printer. By eliminating the need to store several sizes of each font, TypeManager saves drive space.

Adobe TypeManager. 29824 - \$55

Adobe Plus Pak. 29834 - \$107

Build the Town

Are you a model citizen? Or does every policeman know you by name? It doesn't matter in SimCity, because you're the boss. Build the perfect city or create the most bizarre urban landscape you can imagine. You're the mayor, the planner, the cop on every beat. And the Sims — the simulated humans that live in your city — always respond to your decisions.

SimCity. 28678 - \$28

SimCity Supreme. 28680 - \$47

Scan by Hand

If you can't set up an elaborate scanning station, try the hand-held ScanMan from Logitech. You'll get

32 shades of gray in photographs, drawings, logos, and illustrations up to four inches wide. Connects directly to the Mac SCSI for easy installation. Resolution from 72dpi to 400dpi delivers a quality image both on screen and on paper. **ScanMan 32.** 22751 - \$317



M - O - N - E - Y

Bypass painful bookkeeping chores with Quicken, the money management program that costs you less than an hour with an accountant. Keep tabs on your expenses, watch the bottom line of your small business, and track your personal income — all at the same time. Quicken writes and addresses checks, reconciles your bank statement, and lets you know where you are with the budget.

Quicken. 28458 - \$35

Keyboards

Have it Your Way

The Switchboard, the first modular keyboard for the Macintosh or PC computer, gives "user-friendly" a whole new meaning. The keypad and cursor key can be on the left or right — you decide.

The Switchboard.

25182 - \$174

Hide Your Work

This MacAvenue keyboard drawer holds all standard and extended Mac keyboards. Interior dimensions of drawer are 22.25" x 9.5" x 2.25". Comes complete with all installation hardware.

MacAvenue keyboard drawer.

41753 - \$19



Everything at MacAvenue is designed to give you the affordable, reliable Macintosh products you want *when you want them.*

- Orders placed by 8:00pm, CST, weekdays for "in stock" items ship the same day (barring system failure and to shipper's "next day" zip codes) with a \$2 overnight delivery charge.
- VISA, MasterCard and American Express accepted. No surcharge.
- COD orders accepted. (Add \$6 including shipping).
- Purchase orders accepted.



Call for
FREE
catalog!

800-388-6221

Key Code 9521

MacAvenue
A Division of CompuAdd Corporation

12303 Technology Boulevard,
Austin, Texas 78727

Less Than 5 Minutes To Learn
And Extremely Easy to Use

Two Great Ways to Label Your Business for \$49.95



A Preconfigured MailList & Address Book MyAdvancedMailList



This simple to use program will help you get organized in minutes. Great for your business or your personal contact list. **Holds** 30,000 records per file. **Sorts** by name, zip code or any of 15 fields, 3 levels deep. **Prints** 10 different label sizes, 6 roster/booklet sizes, envelopes and rolodex cards. **Export** and mail merge with most word processors. **Imports** text files and data base files.



A Free Form Label Making Utility MyAdvancedLabelMaker

Are you tired of spending hours learning how to customize your database to print labels? Take five minutes to learn MyLabelMaker instead. Great for file folder labels, cassette labels, fax labels, name tags, price tags and more. Imports and creates art, serializes labels, catalogs diskettes and more.

MySoftware Co.™

Same Day Shipping

30-Day Free Trial

To order
Phone 1-800-359-9890
FAX (415) 325-3106

My Software Company
1259 El Camino Real, Ste 167
Menlo Park, CA 94025

Payment: ☐ Check ☐ Visa ☐ MC ☐ AMEX

Card # _____ Exp. Date _____

Name _____

Address _____

City/State/Zip _____

☐ MyAdvanced MailList \$49.95

☐ MyAdvanced LabelMaker 49.95

Shipping & Handling 2.95

(Calif. add sales tax)

MW 9/90 TOTAL _____

Q, put their own logo into a font. They wanted to get access to outlines in FreeHand, to do effects.

Metamorphosis realized that need. It created the PostScript code. A hacker friend of ours developed a PostScript trick that allows us to extract a font outline from the laser printer. We actually pull the outlines from the printer.

MW Didn't that present problems for Adobe?

VON EHR Adobe is pretty careful about [allowing access to their fonts] and has a lot of safeguards to prevent people from getting access to them. But we announced Metamorphosis on the opening day of the Seybold conference at which John Warnock announced that the PostScript format has been opened. It was a relief on one hand and frustrating on another because we had a big announcement that was overshadowed by Adobe.

The program has two planned releases. The first allows us to convert Type 1 fonts to an editable format. the second release, which we're still working on, converts any font from one format to another—TrueType to PostScript Type 1 and the converse. And of course there are a lot of people interested in going the other way: those with installed libraries of PostScript fonts.

MW When will the second part be ready?

VON EHR As soon as Apple freezes the specification for TrueType, maybe this summer. We have it working and we're going to ship a version that does the conversion, but Apple changed the spec so we decided to hold off until the specification is frozen.

MW What is your perspective on the PostScript/TrueType conundrum?

VON EHR I'm pleased that Apple got Adobe to open up its font format. I also think that Apple has made a lot of work for all of us. TrueType is powerful but difficult to make type tools for. We should let users draw type and have the product store the outlines in whatever format users want without

knowing about the problems involved. And TrueType is extremely complex, worse than Type 1 PostScript fonts. We worked on Type 1 fonts for two weeks to develop a font tool, but it has taken us over a year for TrueType.

MW What is the problem?

VON EHR There are two problems. First, the data representation for TrueType fonts requires some approximations. Essentially the way we describe curves in Type 1 is the way we describe curves in PostScript, as a bezier curve. The problem with TrueType is finding out how to best approximate curves. It's always difficult to reduce a cubic curve to a quadratic curve (the type used in TrueType). It can take two or three quadratics to do that, and we have to figure out how to represent the TrueType font with the least number of curves. That's the first problem.

Second is the problem of hinting, which requires us to generate a program for TrueType. The issue is that this problem is more complex than is the case for Type 1 fonts.

MW Why?

VON EHR It's an issue of a descriptive versus a procedural approach. In Type 1 we specify important coordinates. For example, in a T there is a specification for the left and right sides of the vertical stem of the T. Type 1 hints assure that every stem of that font is the same. We have to provide hints that tell the Type 1 font how to interpret the width of features such as the vertical stem width. This interpreter makes all of the stems the right width when they are printed.

In TrueType you have to adjust each point on an outline. And the program for TrueType has to specify the order in which the points are adjusted—in Type 1 you just note the important points. In TrueType you have to specify what point to move where and in what order.

MW How do you write software to do this?

VON EHR In Type 1 fonts you just have data statements, hints that describe (continues)

TO EXPERIENCE COMPUTING WITHOUT BOUNDARIES, PICTURE YOURSELF HERE.



*Your newsletter is on the Mac in Microsoft Word. The boss submits a story written on his PC in WordPerfect... **complete with illustrations.** MacLinkPlus translates the file easily, **text and graphics**, with your MacLinkPlus cable connection between the two machines.*



Contributors to your weekly sales update just put their DOS files on the Novell server—the letter's in Wordstar, the pricing in Lotus Symphony, and the mailing list in dBase. With MacLinkPlus, you can translate all the files into MacWrite II on your Mac and do your update in no time.



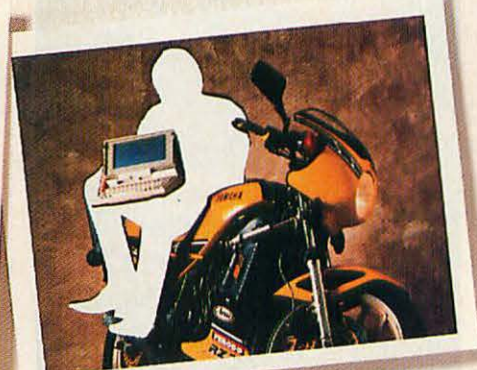
*You're a consultant with a Mac whose clients love your reports so much they keep making urgent demands that you send them via **modem for use in their favorite PC packages.** No problem with MacLinkPlus. In minutes, you can send each file over the modem directly into the PC package of choice.*



*You're doing a presentation for a large screen Mac in Aldus Persuasion. The analysis and graphics from the regional office look great... **but they're in Harvard Graphics on a DOS diskette.** Just use MacLinkPlus to translate the contents of the disk directly into graphics files for Aldus Persuasion.*



You run a next day desktop publishing service. You have a Mac with a modem and DOS drive to receive customer files. Pictures, text, and spreadsheets arrive in DOS, Mac, or NeXT formats. With MacLinkPlus, everything gets translated directly into the program of choice.



You publish a weekly ecological survey on your Mac. Maps are in AutoCAD on the PC, sketches from PC PaintBrush on the PC, and tech writers use XYWrite on DOS laptops. With MacLinkPlus, everyone uses what they've got, while you pull it all together in your favorite Macintosh applications.



Solve these and thousands of other file exchange problems with award-winning MacLinkPlus software. With more than 150 translators, the possibilities are endless. Transfer and translate files in either direction between programs on the Mac and programs on the PC running under

DOS or Windows.

For file servers, networks, or DOS drives, get MacLinkPlus/Translators for only \$169. Get MacLinkPlus/PC for \$199 if you also want modem or cable connections.



Find out more about why MacLinkPlus is standard equipment for the Macintosh. For more info or the **Circle 45 on reader service card**

name of your nearest DataViz dealer, call (203) 268-0030 today.



MACWORLD EXPO
BOOTH #5128

DATAVIZ
THE DATABRIDGE SPECIALISTS

All product names are trademarks of their manufacturers.

**THE MACLINKPLUS USER
KNOWS NO BOUNDARIES.**

Introducing: the MousePen Pad*

The MousePen Pad

For use with:

IBM PC/PS2,
MAC or Portable
MousePens



IMCS - 1332 Vendels Circle, Paso Robles, Ca. 93446
PH 805-239-8976 800-448-1184 FAX 805-239-8978

actual size
3" x 3"

A 3 inch square MousePen Pad doesn't take up much desk space. It's light, portable, compact and easy to use, and the Post-it design makes it convenient to have around.

The MousePen Pad works with the most advanced pointing device technology available, The MousePen by IMCS. Imagine the precision of a pointing device that calls a three inch square home!

**For use only with the
MousePen by IMCS.*

**For more information,
see your local dealer or call
IMCS at 1 800 448-1184**



1332 Vendels Circle
Paso Robles, CA 93446
805 239-8976

IBM and PS2 are registered trademarks of International Business Machines Corporation. Microsoft is a registered trademark of Microsoft Corp. Apple, Mac and ATM are registered trademarks of Apple Corp. Post-It is a registered trademark of 3M Corp.

VERBATIM

coordinates. In TrueType we must write a program in TrueType language; it's the equivalent of PostScript because it has its own language. It's kind of like a powerful assembly language. Consequently TrueType gives more access, more control, but at a cost. There are more instructions required to do things like give font hints.

MW So working with TrueType will be like learning with the red and blue books [basic programming references] for PostScript?

VON EHR Right. The difference is that TrueType is still evolving, still has capabilities missing. For instance, the ability to define procedures and sub-routines is somewhat weak. One example is the routine you would use to describe a call to the serif of a single character of a font. In PostScript that's easy, but in TrueType I'm not sure that it can be done. It may be my ignorance—we all have a lot to learn about TrueType, and we only have a rough draft of the equivalent of the PostScript red book.

MW What is the future of PostScript?

VON EHR I think that Adobe's development in PostScript 2 will address problems of version 1: problems with screen angles and screen frequencies that cause moirés in printing; also the problem in the first version of limits, for example in complex figures. PostScript flattens curves into short, straight segments that approximate the curves, but it has a limit of 1500 line segments. So if a particular figure is really complex it might print on the LaserWriter but not print on a Linotronic.

Also, the performance of PostScript 2 will be faster. And some of the technology for Adobe Type Manager will be incorporated into PostScript 2.

MW What is the future of Adobe Type Manager?

VON EHR I think that it's fairly good. Even with TrueType, ATM will have a reasonably big base, and TrueType won't be generally available for a year.

It's in developers' hands but not in the general public's, so that Type 1 fonts have even more chance to be established. TrueType will eventually be stronger if Apple and Microsoft improve it, and in two years it will be popular.

MW FreeHand and Illustrator—how do you compare the two?

VON EHR Hmm. I'll have to think carefully about that. I think I can say that FreeHand is easier to use. I think that Free-

Hand has more capabilities, that there is more that can be done with it. It was the first Mac product to have style sheets for graphics. FreeHand has named colors and so can edit colors more easily. Type handling is superior. Illustrator has smoother drawing and a bigger mindshare. Illustrator has a bigger installed base than FreeHand—Adobe was out there with the product for almost two years with no competition.

MW Will there be a PC version of FreeHand? With Windows 3.0?

VON EHR That's what will make FreeHand possible on the PC. We'll see something running in 1990, but probably not shipping.
(continues)



*I get tired of people
clamoring for a low-cost
Mac. I don't want a toy.
I want a computer
that can do useful work.*

Concerned about your image?



300 dpi, 256 Silverscan Palette



300 dpi, 16.8 Million Colors



300 dpi, 256 Apple Palette



300 dpi, 64 Color



300 dpi, 16.8 Million Colors



300 dpi, 256 Gray-Scale

La Cie's Silverscanner will produce just the right image for you!



La Cie's 24 bit, 300 dpi color scanner can scan up to 16.8 million colors in one pass producing production quality images for publishing and graphic presentations.

Silverscanner™ produces 256 shades of gray with outstanding clarity at resolutions from 50 to 600 dpi making it one of the best 8-bit gray scale scanners available!

Silverscanner comes with Silverscan™ Software which scans images quickly and accurately with full function image controls such as gamma color correction, halftoning and color dropout.

Silverscan saves scans in a variety of file formats such as, MacPaint™, PixelPaint™, PICT, TIFF or EPSF in order to image process in most graphics applications.

In monochrome, 16 or 256 shades of gray, 8, 64, 256 or 16.8 million colors Silverscan can scan!

This ad was created using unretouched 300 dpi Silverscanner scans from 2" x 3" prints, Pagemaker for page layout and PrePrint and a Linotron 300 for color separations.

Call us now.
(800) 999-0143
(503) 691-0771

laCie LTD

laCie LTD

MAZDA MIATA GIVE AWAY - August 1990, Boston MAC WORLD
If you miss it, here's your chance to win a 1991 Surprise! Enter by simply filling out the form below or a 3 x 5" card and mailing to La Cie Ltd.

SWEEPSTAKE RULES # 0010065

1. No purchase necessary. Drawing to be held around August 1990. Grand prize is valued at no less than \$15,000.
2. Sweepstake is open to all residents of the U.S. over 18 years of age except employees of La Cie, except where prohibited or restricted by law which includes, without limitation, residents of the states New York, Rhode Island and Florida. Drawing is limited to one entry per person.
3. The entry deadline is July 31, 1991.
4. Winner to be notified by mail or phone and may be required to sign an affidavit of eligibility and a release as a condition of receiving prize. In the event that the winner does not respond within 30 days, an alternate winner will be chosen.
5. Odds on winning depend on the total number of entries received. No prize substitutions or cash payments are allowed.
6. Taxes, liability, and delivery of the grand prize are the responsibility of the winner.
7. Void where prohibited by law. All federal, state and local regulations apply.
8. Winner will be selected in a random drawing conducted by La Cie, Ltd. or its designee. All decisions are final.
9. For notification of the winner, send a stamped self-addressed envelope to La Cie, Ltd.

OFFICIAL ENTRY FORM # 0010065

La Cie, Ltd. • 19552 SW 90th Ct. • Tualatin, OR 97062
Please print clearly

NAME _____

COMPANY _____

TITLE _____

STREET _____

CITY, STATE, ZIP _____

PHONE NUMBER _____

See us at MAC WORLD Expo, Booth #5427

Introducing: the MousePenMac

The MousePen Mac actually works like a mouse but is shaped and held like a pen. Unbelievably light, responsive, precise and easy to use, the MousePen Mac actually operates in a mere 3" square. A touch of the button instantly turns on the dynamic gain of 100 to 1,000 CPI for ultimate control. So now you can adjust mouse response on the fly!

The MousePen Mac
For Apple ADB systems.
No driver required.

\$129.00 suggested retail.
Also available for PC
and lap top.



actual size

For more information,
see your local dealer or call
IMCS at 1 800 448-1184



1332 Vendels Circle
Paso Robles, CA 93446
805 239-8976

IBM and PS2 are registered trademarks of International Business Machines. Microsoft is a registered trademark of Microsoft Corp. Apple, Mac and ADB are registered trademarks of Apple Corp.

VERBATIM

MW How will the performance of the two products compare?

VON EHR The PC version will be comparable to the Mac version. Running it on a 25MHz, 386 machine will be comparable to a Mac II.

MW FreeHand is still slow. Why?

VON EHR Internally we have a display PostScript interpreter. Illustrator draws into the screen buffer, which requires a lot of memory, equal to the size of the screen. We don't require off-screen memory. The downside is that we have to convert to QuickDraw. We go through the work of display PostScript and then convert to QuickDraw calls. We did it that way to be compatible with the Mac programming model. Apple says clearly in the Mac programming manual not to talk directly to the screen.

MW Illustrator does that.

VON EHR Illustrator breaks when new Macs come out because Apple changes the rules of how QuickDraw works. With FreeHand we pay a price in performance to obey Apple rules. But we have taken that issue to heart and have an answer in 3.0. We're working on it.

MW Will we see the program at the August Macworld Expo?

VON EHR We are hoping. We're working on the ease-of-use and performance issues.

MW How about things like file conversions? The features in Adobe Photoshop that allow one to do that are really great.

VON EHR FreeHand is able to read PICT and EPS files and we plan to continue in that vein. We have always done color separation in FreeHand, as well as PostScript will allow, with its problems with both screen angles and screen frequencies.

MW Which Adobe will soon improve.

VON EHR Exactly.

MW Can Altsys make it as a small soft-

ware developer? We're in an era of mergers.

VON EHR I think we can. Our corporate charter is that we don't have to be the biggest or the fastest-growing company, but to be the best. When people think of Mac graphics I want them to think of Altsys.

We do look at acquisition and wonder if it is the right time to be acquired. I have a problem in going public or being acquired.

We're a little too small to go public, and the market punishes those companies that have long-term thinking. Next-quarter earnings are more important to public companies than the next three years. Management is always accused of short-term thinking, but they're graded for short-term thinking.

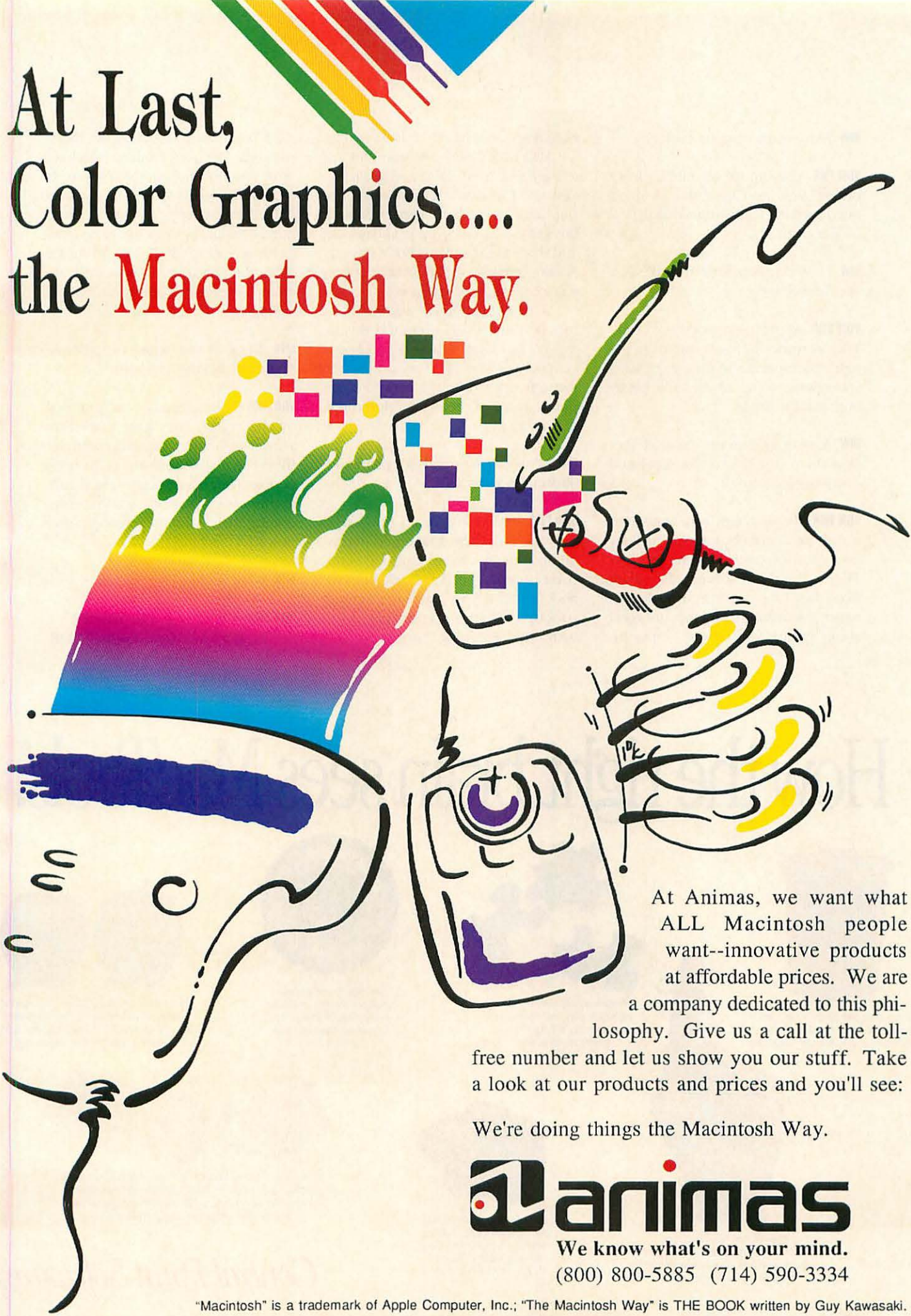
MW What about acquisition?

VON EHR There are two downsides. It is hard to protect employees' jobs. We only have 26 employees, so I do not have a lot of positions to cut. I am careful to hire good people so there are none to slash, and that is typically what an acquiring company does. There is a time to sell, and our original plan was to grow and sell the company. Most people believe that you sell a company when it is at a peak, but I disagree. I believe the time to sell a company is when products are mature in engineering and it is time to milk them for maximum revenues. Some people sell their companies when they are at their most popular. It would be time for us to sell the company now if that were our model.

And when companies are sold they immediately slow down. There are meetings, and you lose control to new managers who want to assert their own control. I think that right now it's a very competitive market and that if we spend lots of time in meetings we would fall behind.

MW What is the offer you couldn't refuse?

VON EHR Oh, three times sales. Say \$9 million.
(continues)



At Last, Color Graphics.... the **Macintosh** Way.

At Animas, we want what ALL Macintosh people want--innovative products at affordable prices. We are a company dedicated to this philosophy. Give us a call at the toll-free number and let us show you our stuff. Take a look at our products and prices and you'll see:

We're doing things the Macintosh Way.

 **animas**

We know what's on your mind.

(800) 800-5885 (714) 590-3334

"Macintosh" is a trademark of Apple Computer, Inc.; "The Macintosh Way" is THE BOOK written by Guy Kawasaki.

Circle 89 on reader service card

MW Aldus is the obvious choice?

VON EHR Yes. But we get nibbles from others. Venture capitalists ask if we need money. I say we're doing well on our own.

MW How do you relate to Apple as a small developer?

VON EHR Apple treats us fairly well. They're working closely with us in the font area, especially in the area of Asian [nonroman] fonts, where we're pretty important to them.

MW As a small developer and publisher how do you relate to the retail and distribution channel?

VON EHR We are happy with MacAmerica in the distribution channel. They do a good job on the Macintosh side. They were the first with Mac products, they make consistent orders in reasonable quantity, and they are good about paying for software—an attri-

bute not shared by other distributors.

Mail order has been good for us as well. Our products are specialized, and not too many retailers want to put them on the shelf. Retail wants to buy Claris, Microsoft, Aldus, and Adobe and that's about it. If it's not a spreadsheet or database the retailer is not too interested in carrying it.

With Fontographer we're in distribution and mail order, and that is most of our sales. Almost none (2 percent) of our sales are direct, primarily those people without access to computer stores or those who don't like mail order.

MW What are the trends for paint and illustration software?

VON EHR Paint software, in the sense of black-and-white, bitmap editing is going away. We'll see more high-end paint packages such as PixelPaint Pro and ColorStudio—photo-retouching packages, not so much paint packages, with halftone editing features.

Illustration is going to get more painterly. I've been thinking for a long time that our illustration software is too hard-edged, technical, and too dull. Paint systems are much more human looking, but they have no quality when you zoom in. The future for illustration programs is in better-integrated textures, to give more human feeling.

MW What is the biggest challenge Apple faces in the near term?

VON EHR The company is surrounded by challenges. They have moved toward workstation capability and yet they can't abandon the entry-level people. They have to satisfy the clamor for the low-end machine without abandoning their vision of an easy-to-use, powerful machine.

MW What is a low-end machine?

VON EHR My idea? A Mac based on a 68030, at a low speed, would be OK.

How the right brain sees MacTools®



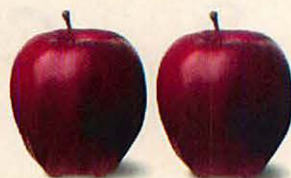
If you drag one file too many and empty the trash, our file recovery tools make it a snap to get files back.



Fragmented files slow down your disk. MacTools Optimizer puts together the pieces and speeds up file access.



Encrypt financial data, employee records, and other sensitive information in a format nobody can crack. Except you.



Make exact copies of floppies fast. MacTools takes full advantage of your computer's memory to reduce disk swapping and lets you make as many copies as you like.



Forgot where you put a file? MacTools will find it by name or text in seconds and even let you view it to make sure it's the right one.



With MacTools daily backups are as quick and painless as taking your vitamins. Back up your whole disk or just the files or folders you want.



You wouldn't drive without a seat belt—don't operate your Mac without one either. MacTools copies critical volume information daily (or more often) to protect against hard disk crashes and accidental initialization.

Central Point Software INC.

I'm after a machine that will last ten years in the market, like the Apple II. To do that today a machine will need virtual memory. Applications years from now will need many megabytes to run. I would hate to see Apple make a machine today that won't run applications in a few years.

It must have space to upgrade RAM memory. It's OK to ship a machine with 1MB or 2MB of RAM, but it must be expandable. Expansion to 4MB is reasonable today. But in five years 20MB to 30MB will be needed.

The home computer that will finally be useful in the home will have a performance rate of about 150 MIPS, 100MB of RAM, a 1-gigabyte hard disk. And access to a high-speed network. We'll see that in the 1995-to-1997 time frame.

MW Do you have any comments about the demand for a low-cost machine?

VON EHR I get tired of people clamoring for a low-cost Mac. I don't want a

toy. If I wanted to program a toy I would work on Amiga or Atari machines. I want a computer that can do useful work for people at a low price. People bought lots of Apple IIs in the \$1500 price range ten years ago, so I don't think it's unreasonable to ask people to pay \$2000 today.

Comparing the Mac to Taiwanese clones is not useful. If you can get your work done on a PC clone, fine, then you should be using one. But many people can't get past the interface on a clone.

MW What do you think about John Sculley as the head of technical development?

VON EHR He'll be a busy man. I wish him well but I don't see how he can lead the technology group. He's a real smart guy, but he doesn't have the technical background to understand the issues.

Of course it could be a situation like at IBM where there is a lot of

technology within the company and marketing only lets a part of it see the light of day. There could be great technology in the Apple labs [and Sculley could facilitate its marketing].

MW What technology should Apple be adding to the Macintosh?

VON EHR I am intrigued by the object-oriented approach that Next has taken in its system software. I think that should be considered. Hardware-wise, we're missing graphics accelerators, but there is another issue in hardware. DMA [direct memory access] is needed to increase the access speed to the disk. There is a lot of commentary about the need for multitasking, but that will depend upon the availability of DMA.

MW Are Mac clones a possibility?

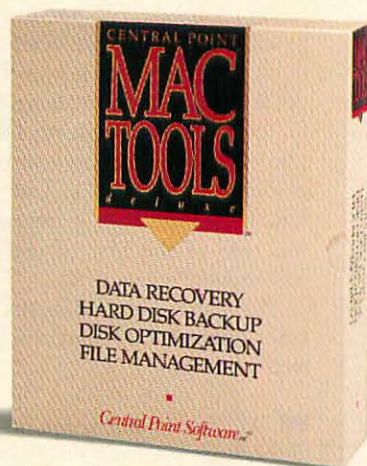
VON EHR I talked to someone two years ago who wanted my help in building (continues)

How the left brain sees MacTools.®

	MAC TOOLS	SUM II	FASTBACK II	RETROSPECT	DISK EXPRESS II	GOFER	SENTINEL
HARD DISK BACKUP	✓	✓	✓	✓			
Selective backup & restore	✓		✓	✓			
Data compression	✓		✓	✓			
Save file/folder selections	✓		✓	✓			
DATA RECOVERY	✓	✓					
Selective/intelligent search	✓						
Pause & view during undelete	✓						
Recover files in-place	✓						
OPTIMIZER	✓	✓			✓		
Visual display of fragmentation	✓				✓		
DATA PROTECTION	✓	✓					
FILE LOCATE	✓					✓	
HARD DISK PARTITIONING	✓	✓					
FILE ENCRYPTION	✓	✓					✓
FAST FLOPPY DISK COPYING	✓	✓					
DISK/FILE EDITING	✓	✓					
U.S. LIST PRICE	\$129.00	\$149.95	\$189.00	\$249.00	\$89.95	\$79.95	\$149.95

Only one Macintosh utility package supplies all nine essential utilities. And gives them to you for a price either side of the brain can appreciate. *For a free brochure or the MacTools dealer nearest you, call 1-800-445-4087.*

MacTools is a registered trademark of Central Point Software. All other products names are trademarks of their manufacturers.



Central Point Software™ INC

one. They wanted me to work on the system software in the ROMs. I told them no, that there was too much work there. I estimated 100 man-years and that was two years ago.

MW But it could be done?

VON EHR Yes.

MW In a legal way, much as IBM ROM BIOS was cloned?

VON EHR It could be, but Apple is a moving target. You've got the SEs, the Mac II, the IIfx. The question is what functionality you would want to implement. The Mac has a massive software-development investment; the hardware is not a problem. But Apple understands that the value lies in its software these days.

MW What are your favorite products, other than your own, in hardware and software?

VON EHR Think C. It's the best development environment we've ever seen. It's better than Apple's MPW because the turnaround time is so fast. You can make changes and see your program run. It's the fastest we've ever seen, even on workstations. But we're up against its limits now with development on FreeHand. To do FreeHand we have to merge some of the external subroutines where we blow the jump-table limits.

For software, I admire the simplicity of MacWrite. I use version 4.6. I don't need any more power for what I do, and it's better than Microsoft Word for letter and word spacing. DeskPaint [Zedcor] is still available without upgrading to DeskWorks. And the first time I saw PixelPaint, it amazed me. It was one of the first to use pop-up menus like FreeHand's.

For hardware, the Mac IIfx and the LaserWriter IINTX hum along pretty well.

MW We are seeing a lot of companies releasing fonts on CD. Is that the future?

VON EHR I have a question about the quality of a lot of the type on the discs. There is a lot of quantity.

MW Aren't we talking about the standard type libraries from companies like Linotype and Monotype?

VON EHR I believe that those companies would disclaim creation of some of the type on the discs. Remember that fonts can be implemented poorly.

MW What about gray-scale fonts?

VON EHR We don't believe in them. Apple doesn't believe in them. They're



*A 24-point gray-scale font,
when scaled to 25
points, turns to garbage.
Gray-scale fonts
just don't scale well.*

useful for one thing, video. You can't print them if you don't have a gray-scale printer. There is no on-screen support for them, and there is limited support for gray scale on the Mac II ROM chips. Letraset makes them. But a 24-point gray-scale font, when scaled to 25 points, turns to garbage. They just don't scale well. ATM doesn't support them. TrueType doesn't support them.

MW But they make a computer screen as readable as paper?

VON EHR Yes, by blurring the characters. I would rather increase readability by increasing the resolution, by moving from 72 dots per inch to 96 dpi or to 144 dpi. At 144 dpi you have twice the resolution

and characters are crisper.

MW What do you think about the Personal LaserWriters?

VON EHR It's great for the Mac and great for us if more people can afford laser-printer quality. It also opens up an interesting opportunity for someone to do a PostScript-printer driver, if they're quick. A lot of our customers require PostScript-quality graphics, but with ATM and TrueType, everyone can get excellent fonts, even on a Quick-Draw-based printer.

MW What is the future of Mac type?

VON EHR The market is getting full. All the major players are now in the Mac market. So there will be a shakeout. I predict prices will drop.

There will be a lot of jockeying with TrueType, which presents a new opportunity for sales. I see lots of opportunities for tool makers. Now that the market has opened, Adobe has removed the quality barrier so that Fontographer users can produce type of the caliber of the major type foundries.

MW Who do you expect will be the new font developers?

VON EHR Most graphic artists I know have at least one typeface in them. One font that they would like to see on paper. And many companies will want to do their logos.

MW Can small type developers really succeed?

VON EHR Casady & Greene has begun to be considered a serious type foundry. Zuzana Licko at *Emigre* magazine. David Berlow, formerly of Bitstream, has founded a company with Roger Black called The Font Bureau [in Boston], making fonts for magazines.

There is a renaissance of small type houses. People can get into the market for a low up-front expense, and they are only limited by their creativity. Top font designers from throughout the world are working on the Mac, like Matthew Carter, vice president at Bitstream. Matthew has said to me that the tools on the Mac today are better than ever before. **M**



Here's 10 Good Reasons to Purchase from CDA Computer Sales

There are lots of good reasons to purchase your Macintosh, peripherals and software from CDA. But here's ten that we think you won't refuse. We're offering ten dollars to first time customers who order from CDA from now until September 30, 1990. *We want you to try CDA.* So if your order is \$100 or more, we'll take ten off your purchase just for becoming part of the family of satisfied CDA customers. *Let us prove to you that at CDA Computer Sales our customer's satisfaction is the bottom line.* From our knowledgeable sales staff and customer service representatives, to our technical support team and warehouse crew, every order receives personal care—from start to finish.

Of course, top notch, quality service doesn't come easily. Ten years of experience in computer mail order has helped us to achieve this high standard of service. Since 1980 CDA has been serving customers worldwide. Growing along with the personal computer industry has enabled us to acquire the knowledge and experience necessary to help you get what you need, when you need it, at the right price—with full support and service.

So take ten, and relax. We will provide you with *Complete Macintosh Solutions* that are truly "buyer friendly".



Hardware, Software & More

Macintosh Computers

We carry the full line of Macintosh computers. Please call for CDA's lowest price! Look on the next page for complete ready-to-run systems.

Macintosh Portable

Macintosh Portable w/1 Mb & 40Mb HD	\$4195
Numeric Keypad	\$59
Prometheus 2400 Baud Travel Modem	\$379
1 Mb Upgrade	\$369
2 Mb Upgrade	\$749
3 Mb Upgrade	\$1149

Generation X Portable Publisher Video Card

Portable Publisher allows you to connect your Mac Portable to an Apple 12", 15", 19" or 21" monochrome monitor and other 15" to 21" monitors.

The Dual Screen INIT software allows you to use the monitor and your Portable's LCD screen at the same time giving you even more work space. **\$449**

The Publisher SE Series Video Cards allow you to connect a Mac Plus, SE or SE/30 to an Apple 15" or 21" monochrome monitor. **\$369**

Monitors & Video Cards

Apple High Resolution RGB	\$799
Micron 8-bit Video Card (Mac II, SE/30)	\$349
Apple Display Card 8.24	\$719
Apple Display Card 8.24GC	\$1619
Cutting Edge Two Page 19"	\$899
E-Machines ColorPg T-16 w/video card	\$2395
Magnavox Mac Color 14"	\$459
NEC MacSync HC 14" Color	\$499
Radius Two Page Display	\$1099
Two Page Interface Card	\$485
Radius Pivot Display	\$819
Pivot Interface Card	\$596
Ikegami CT20 20" Trinitron w/8 bit card	\$3149
SuperMac Trinitron 19"	\$3250
Spectrum 8 Series III	\$1449
RasterOps ColorBoard 264 (Mac II)	\$649
Kensington AntiGlare Screen (SE)	\$59
Kensington AntiGlare Screen (Mac II RGB)	\$69



Radius Pivot Display

The Pivot rotates from portrait to landscape display with a simple turn of the screen. It comes with 4 levels of gray, expandable to 16, and is compatible with virtually every Macintosh application. For the SE/30 and Mac II family of computers. **\$819**

Speed up Your Mac!

DayStar 68030 PowerCard's w/68882 math processor. (Available for the Mac II, IIx, IIcx)	
25, 33, 40, & 50 Mhz	Please Call for Pricing
DayStar Fast Cache IIci	\$639
Dove System 7.0 Upgrade (68030 Upgrade for Mac Plus, SE, SE/30, II, & IIx)	\$459
Micron Xceed Cache Card	\$585
Radius Accelerator 16 (SE/Plus)	\$639
Radius Accelerator 25 (SE)	1099

MSF 300Z

by Microtek



Scanners

Microtek MSF 300Z w/SCSI	\$1899
Microtek MS II w/SCSI	\$1099
Microtek MSF 300GS w/SCSI	\$1559
Abaton Scan 300/GS	\$1479
Logitech ScanMan 32 Now w/Gray Scale	\$379
Complete Page Scanner w/Omni Page	\$749
Thunderware ThunderScan	\$169
Digital Vision ComputerEyes Color	\$349
Caere Omni Page Software V2.1	\$569



Switchboard by Datadesk

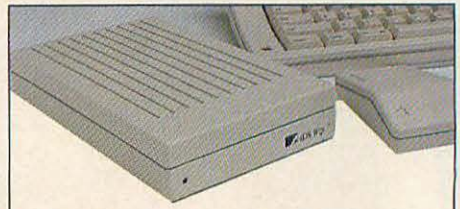
The unique modular design of the Switchboard allows you to arrange the keyboard layout into the position which is most comfortable for you. A trackball module & function key module can also be added. It is designed for both right and left handed users and is compatible with both IBM and Macintosh computers. **\$175**

Input Devices

DataDesk Mac 101 Plus	\$135
DataDesk Switchboard	\$175
DataDesk Trackball Option	\$149
DataDesk 15 Function Key Option	\$139
Kensington Turbo Mouse ADB	\$109
Kurta Tablet 12 x 12 ADB	\$419
Mouse Systems Trackball	\$69
Mouse Systems Little Mouse	\$75
Microseeds WristMac	\$189

Applied Engineering 3.5" Disk Drive

The AE 3.5 800K Drive offers you all the reliability and performance of Apple's 3.5 drive but at a more affordable price.	
The 1.4 Mb capacity upgrade lets you store 2-disk applications on one high density disk.	\$189
3.5 Drive w/1.4 Mb Upgrade	\$229



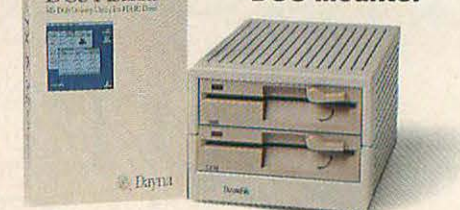
Wip Hard Drives by IDS

The Wip series boast a portability not found elsewhere—at 1" x 5" x 8" it's roughly half the size of the market's smallest drive. Its airtight design has fewer moving parts and keeps dust out to provide a higher level of reliability. **20 Mb - \$369 40 Mb - \$479 50 Mb - \$509 100 Mb - 789**

Hard Drives

IDS Pro 30	\$399
IDS Pro 80	\$669
IDS Zero Footprint Prology 20	\$399
IDS Zero Footprint Prology 30	\$459
IDS Zero Footprint Prology 40	\$519
Cutting Edge Quantum Series	
40 Mb External	\$509
80 Mb External	\$769
105 Mb External	\$819
40 Mb Internal	\$415
80 Mb Internal	\$675
105 Mb Internal	\$735
SyQuest Removable 45	\$699

DaynaFile & DOS Mounter



The DaynaFile drives let you read from and write to MS-DOS disks using suitable Macintosh applications. DOS Mounter lets you work with MS-DOS floppies within the finder. With DOS Mounter in your System Folder, any MS-DOS disk you put into your FDHD drive will appear on the desktop and behave just like a Mac disk. **DaynaFile Single 360K Drive \$499 DaynaFile Dual 360K/1.2Mb Drive \$719 DOS Mounter \$55**

Prometheus ProModem 2400

Now you can get everything you need for communications in one package. This full featured 2400 baud external modem is AT command-compatible and comes with MAC-KNOWLEDGE communications software and cable. Nonvolatile RAM stores numbers & favorite configurations for immediate availability. **\$189**



Free! 2 Day Express Delivery

800-526-5313

Ad #28-09

Modems

Abaton Interfax 12/48	\$265
Abaton Interfax 24/96	\$369
AE DataLink Express 2400 External	\$189
AE DataLink Express w/MNP-5 External	\$249
AE DataLink Mac Internal (Mac II)	\$199
AE DataLink MacPortable w/Send Fax	\$229
DoveFax Desktop	\$279
Supra 2400 Baud w/cable & software	\$139
Prometheus 2400 Baud. Internal w/MacKnowledge (Mac II)	\$199

Networking

Networking Mac to Mac via AppleTalk

Nuvotech TurboNet (Din 8/DB 9)	\$22
Nuvotech TurboNet (12 Pk)	\$229
Nuvotech TurboNet ST (Din 8/DB 9)	\$32
Nuvotech TurboNet ST (12 Pk)	\$289

Networking Mac to Ethernet

Nuvotech NuvoLink SC	\$319
Nuvotech NuvoLink II	\$279

Networking Mac to IBM/PC

DaynaTalk PC	\$209
DaynaTalk PC Micro Channel	\$279

Networking Software

Network Bundle by Tops	\$189
Microsoft Mail Work Station	\$84
Microsoft Mail Server	\$249
Liason	\$169



Flash by Beagle Brothers

Flash is the fastest, friendliest file transfer program available. Quickly send files & messages to any other Mac, or group of Macs on your

network. Flash even has a chat mode that lets you talk in real-time to anyone else. All file transfers are done in the background, so you never have to wait... **\$119**

Accounting/ Finance Software

Layered At Once!	\$282
Insight OneWrite 1.0	\$85
Insight Expert Series (each)	\$389
Bedford Simply Accounting	\$229
Intuit Quicken 1.5	\$36
MECA Managing Your Money	\$124
Nolo Press For the Record	\$29
Nolo Press Will Maker	\$32
TimeSlips TimeSlips III	\$179

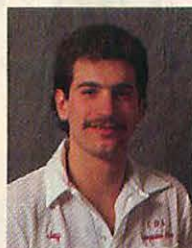
Communications Software

Software Ventures MicroPhone II	\$215
Freesoft Company White Knight	\$89

Desktop Publishing Software

Adobe Type Manager V1.2	\$56
Adobe Type Align	\$60
Adobe Streamline V1.0	\$229
All Adobe Fonts Available	Call for pricing
Aldus PageMaker V4.0	\$499
Aldus Freehand V2.02	\$329
Aldus Persuasion V2.0	\$329
Broderbund Type Styler	\$119
Broderbund Print Shop	\$38
LetraSet Design Studio	\$609
LetraSet ImageStudio	\$275
Timeworks Publish It Easy V1.1	\$116

Free Federal Express Delivery!*



We make sure all stock items ship within 24 hours so you get your order without delay (of course, custom configured systems take a little longer for us to build and test thoroughly). Best of all, CDA picks up the charge for Federal Express delivery on any item under 15 lbs*.

Jay Frantovich, Shipping & Receiving



Publish It by Timeworks

Publish It lets you create sophisticated, professional quality documents faster and easier than ever before. Full featured page layout, word processing, typesetting, graphics editing, painting and

drawing capabilities are rolled into this one self contained publishing package. **\$225**

Drawing/Graphics Software

Abracadata Design Your Own Home Architecture, Interior, or Landscaping	\$75
Adobe Illustrator 88 1.93 w/ATM	\$279
Adobe Photo Shop	\$499
Clarix MacPaint 2.0	\$95
Clarix MacDraw II	\$319
Delta Paint Delta Graph V1.5	\$118
Deneba Canvas V2.1	\$179
Deneba Ultra Paint	\$119
Electronic Arts Studio 8	\$319
MacroMind Director 1.0	\$445
MacroMind VideoWorks II	\$189
Paracomp Swivel 3D	\$319
Silicon Beach SuperPaint 2.0	\$129
Silicon Beach Digital Darkroom	\$248
SuperMac PixelPaint 2.0	\$225
PixelPaint Professional 1.0	\$389

Program/Utilities Software

Abbott Systems Can Opener V1.1	\$65
Apple System 7.0	CALL
Connectix Virtual	\$199
Custom Appli. Freedom of the Press	\$259
Dataviz MacLink Plus/PC V4.5	\$129
Dubl-Click Calculator Construction Set	\$45
Fifth Generation Pyro V4.0	\$22
Fifth Generation Fast Back II	\$107
Fifth Generation Disk Lock 1.0	\$107
Fifth Generation Suitcase II	\$44
Microcom/HJC Virex	\$54
Microlytics GOFer	\$45
Microlytics Inside Information	\$69
On Technology On Location V1.0	\$79
Silicon Beach SuperCard	\$125
SuperMac SuperSpool	see feature
Symantic SAM	\$69
Symantic SUM II	\$94

Word Processing Software

Microsoft Word V4.0	\$245
Microsoft Write 1.0	\$55
Microsoft Works	\$195
Microsoft Office (CD ROM)	\$649
Sensible Grammar	\$52
T-Maker Write Now V2.2	\$117
Word Perfect 1.04	\$229
Clarix MacWrite II	\$168

Database / Spreadsheets

Actius 4th Dimension 2.0	\$469
Clarix Filemaker II 1.1	\$239
Microsoft Excel 2.2	\$245
Informix Wingz V1.1	\$259



Double Helix III by Odesta

Finally, you can have powerful database applications without the complexity. Double Helix 3.0 is the only object-oriented

database program available today. It lets you build custom applications without writing a single word of code—you do all your customizing with user-friendly icons and pictures. (Version 3.0) **\$389**

Music for your Mac

Passport Designs MasterTracks Pro 4	\$299
MasterTracks Pro V3.02	\$209
Trax	\$59
Encore	\$359
MIDI Transport	\$279
Coda Finale V2.01	\$539
Mark of the Unicorn Professional Composer V2.3	\$365
Performer V3.4.2	\$365
MIDI Time Piece (SMPTE/MIDI interface)	\$365
Opcode Vision V1.1	\$339
Studio Plus III (SMPTE/MIDI interface)	\$279
EZ-Vision	\$99
Pro Plus MIDI interface (1 in/3 out)	\$59



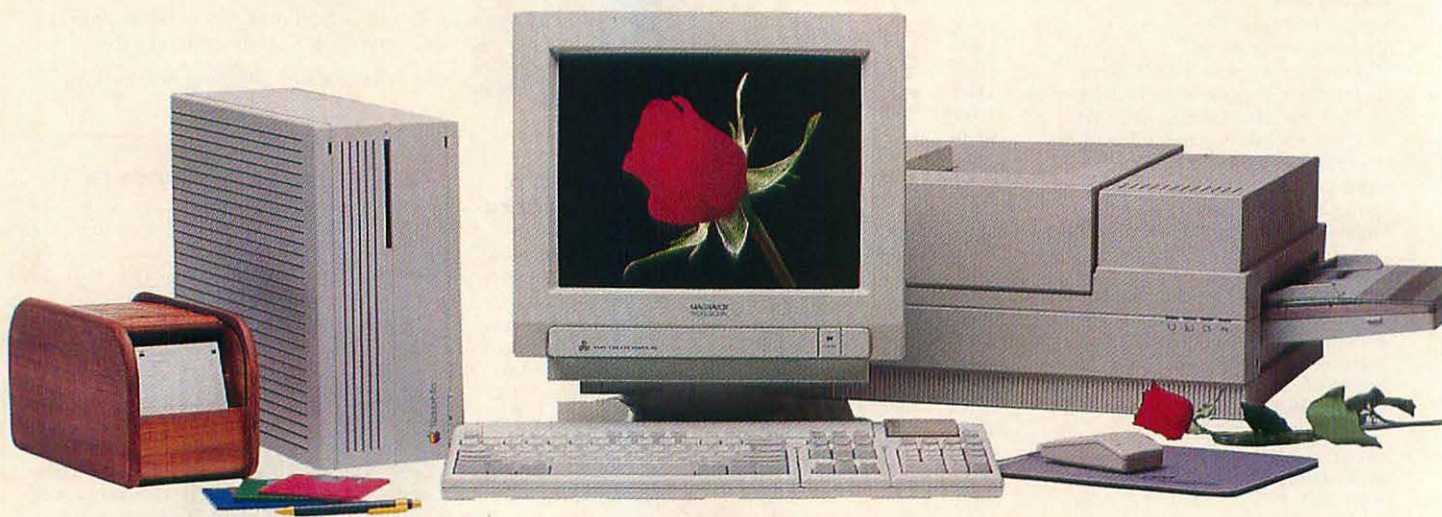
CD Technologies CD-ROM Drive

The greatest benefit of CD-ROM software is the portability of massive information. The Porta-Drive makes this benefit a reality. It's compact, fast and versatile—rated "Best Buy 1990" by MacUser Magazine. Features: 64K memory buffer, compact design, and external power supply (Battery Pack optional) **\$685**

Special CD-ROM Bundle includes CD-ROM Drive, Microsoft Office & ImageClub LetterPress Typevendor **\$1099**

Complete Macintosh Solutions CDA Computer Sales

Complete Macintosh Solutions



Leasing

If the growth of your business depends on the purchase of a computer system *don't wait!* You can lease a complete Macintosh system for less than you may think. Call for details.

Leasing is available to qualified businesses

** based on 48 mo. FMV

* based on 60 mo. FMV.

Educational & Corporate Purchase Orders Welcome!



► Virex by Microcom

Eliminate the possibility of ever losing important files and data due to virus infection! The Virex INIT continuously monitors your system so that all virus infections are prevented from entering your system. If you've already been infected, Virex will repair your files, disks, or hard drive\$54

Complete Ready-to-Run Macintosh Systems

CDA offers Macintosh systems that come complete with everything you need to get up & running quickly! If you would like to custom design a Macintosh system for your specific needs, please call one of our sales consultants at 1-800-526-5313.

Mac Plus/20 System

- Macintosh Plus CPU
- 1 Megabyte of RAM
- IDS 20 Mb External HD w/7 Mbs of Shareware
- HyperCard & MultiFinder
- Virex Software
- 10 - 3.5" Diskettes
- Disk Storage Box
- Mac Plus Dust Cover
- Mouse Pad
- 6 Outlet Surge Protector

Package #9033V

CDA Price \$1449

Only \$42 per mo.**

Mac SE 40 System

- Macintosh SE CPU
- DataDesk 101 Keyboard
- Apple 40Mb Hard Drive
- 1.44 Mb FDHD Drive
- 2 Megabytes of RAM
- HyperCard & MultiFinder
- Virex Software
- 10 - 3.5" Diskettes
- Disk Storage Box
- Mac SE Dust Cover
- Mouse Pad
- 6 Outlet Surge Protector

Package #9041V

CDA Price \$2,599

Only \$72 per mo**

Mac SE 30/40 System

- Macintosh SE/30 CPU
- DataDesk 101 Keyboard
- Apple 40Mb Hard Drive
- 1.44 Mb FDHD Drive
- 2 Megabytes of RAM
- HyperCard & MultiFinder
- Virex Software
- 10 - 3.5" Diskettes
- Disk Storage Box
- Mac SE/30 Dust Cover
- Mouse Pad
- 6 Outlet Surge Protector

Package #9011V

CDA Price \$3,499

Only \$83 per mo*

Mac IICx System

- Macintosh IICx CPU
- Quantum 40 Mb Internal HD
- 1.44 Mb FDHD Drive
- 2 Megabytes of RAM
- Magnavox 14" Color Monitor w/8-bit card
- DataDesk Switchboard
- HyperCard & MultiFinder
- Virex Software
- 10 - 3.5" Diskettes
- Disk Storage Box
- Mac IICx Dust Cover
- Mouse Pad
- 6 Outlet Surge Protector

Package #9024V

CDA Price \$4,899

Only \$116 per mo.*

Mac IICi System

- Macintosh IICi CPU
- w/built-in 8-Bit Video Card
- Quantum 105 Mb Int. HD
- 1.44 Mb FDHD Drive
- 4 Megabytes of RAM
- Magnavox 14" Color Monitor
- DataDesk Switchboard
- HyperCard & MultiFinder
- Virex Software
- 10 - 3.5" Diskettes
- Disk Storage Box
- Mac IICi Dust Cover
- Mouse Pad
- 6 Outlet Surge Protector

Package #9008V

CDA Price \$6,499

Only \$154 per mo.*

Mac IIfx System

- Macintosh IIfx CPU
- Quantum 105 Mb Int HD
- 1.44 Mb FDHD Drive
- 4 Megabytes of RAM
- DataDesk Switchboard
- Magnavox 14" Color Monitor w/Video Card
- HyperCard & MultiFinder
- Virex Software
- 10 - 3.5" Diskettes
- Disk Storage Box
- Mac IIfx Dust Cover
- Mouse Pad
- 6 Outlet Surge Protector

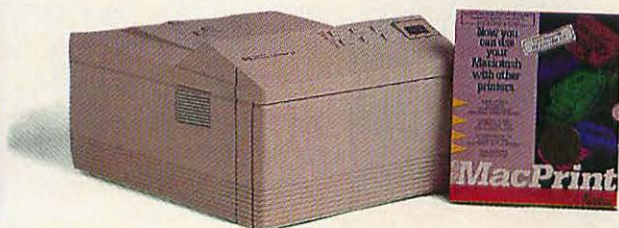
Package #9051V

CDA Price \$8,599

Only \$204 per mo.*

30 Day Money Back Guarantee — One Year Performance Guarantee!

800-526-5313

► **Printer Solutions**► **HP LaserJet IIP Bundle**

The HP LaserJet IIP is the low cost alternative for high quality laser printing. Together with Insight Development's *MacPrint* you can print any Macintosh application utilizing the LaserJet's best possible print quality. This special bundle includes the HP LaserJet IIP printer, MacPrint Software, 1.5 mb of RAM and all necessary cables. \$1399

ImageWriter II Printer Package

- ImageWriter II Printer
- Printer Cable
- Printer Dust Cover
- Extra Black Ribbon
- Package of Paper

Package #9070

CDA Price \$475**LaserWriter IINT Printer Package**

- LaserWriter IINT Printer
- Printer Cable
- Extra Toner Cartridge
- IINT Dust Cover
- Package of Paper

Package #9999

CDA Price \$3,495**Only \$83 per mo***

► **Continue working while you print with SuperSpool & SuperLaserSpool!**

Printers

ImageWriter II w/cable	\$459
Olympia NP-30 w/cable	\$289
LaserWriter IINT w/cable ...	\$3395
LaserWriter IINTX w/cable .	\$4495
HP DeskWriter w/cable	\$869
Kodak Diconix M150 Plus w/cable, driver & ATM	\$529
QMS PS-810 Turbo w/cable	\$2995
QMS Color 100	\$7695
Sharp JX-730 w/software, cable and sheet feeder	\$1799

SuperLaserSpool

SuperLaserSpool quickly processes your documents and fonts then sends them to a spool file. The spooler then sends the file to your printer as you continue to work.

SuperLaserSpool	\$87
SuperSpool	\$58

► **Upgrade Your Mac!**
Now Only \$75 per mb

Fast 80ns Simm Modules

2 Mb - Mac Plus/SE	\$150
4 Mb - Mac SE/30, Mac II, IIcx, IIx300	\$300
4 Mb for Mac IIx	\$399

Video Memory — Upgrade your 4-bit Apple Video Card to 8 bits and get up to 256,000 colors on display

\$89
All CDA upgrades come complete with an easy to follow instruction manual. CDA also provides immediate on-line assistance. Simply call our technical support department and a CDA technician will guide you through your upgrade right over the phone. *Now that's service!*

In data processing, we make sure that your order is handled efficiently and without error so that when you receive your order there are no surprises. If there is a problem, we'll personally call you *before* your order ships. We feel that the only surprise you should get is how well a mailorder company can serve you.

Kelly Warren, Data Processing

► **New! QMS-PS 410 Laser Printer**

The QMS-PS 410 offers you true PostScript laser printing at an affordable price. The combination of the reliable Canon LX Print Engine and the QMS ASAP III technology give the QMS-PS 410 advanced capabilities that distinguish it from its competitors. It comes with 2 Megs of RAM (expandable to 6), 45 resident Adobe typefaces and Adobe ATM (Adobe Type Manager) technology.

Printer Accessories

Organizer Cart by CoStar	\$189
LabelWriter by CoStar	\$185
Apple LaserWriter II Toner	\$109
ImageWriter II Sheet Feeder	\$189

Carry Cases

Targus	
MacPlus/SE XKB	\$69
ImageWriter II	\$54
Leather case - Mac Portable .	\$159

I/O Designs

Ultimate SE Extended	\$72
Macinware SE Extended	\$65
Macinware Plus/SE	\$55
New! Neon Ultimate SE Extended	
Black case with your choice of fluorescent pink, green or yellow accents. Comes w/free matching disk wallet!	\$79

Compuserve's Electronic Mall**Free connect time all through September!**

Check out CDA's all new database featuring complete Macintosh systems, add-on hardware, software & a list of Macintosh accessories. Watch for weekly specials!

"Go CDA"

30 Day Money Back Guarantee**One Year Performance Guarantee**

We guarantee everything we sell to be free of defects for one full year.



Visa, MasterCard, Amex, Discover, Optima, check or money order accepted. CODs up to \$1000 w/cash, certified check, or M.O.

Free 2 Day Express Delivery*

*Hardware & software under 15 lbs. will be shipped free to any destination in the continental US via Two Day Express Delivery! (order must be \$100 or more) For Hawaii, Alaska, APO/FPO, foreign orders, systems & items over 15 lbs please call for rates.

Outside US/New Jersey
(201) 832-9004

Cust. Service 1-800-526-5314
Fax# (201) 832-9740

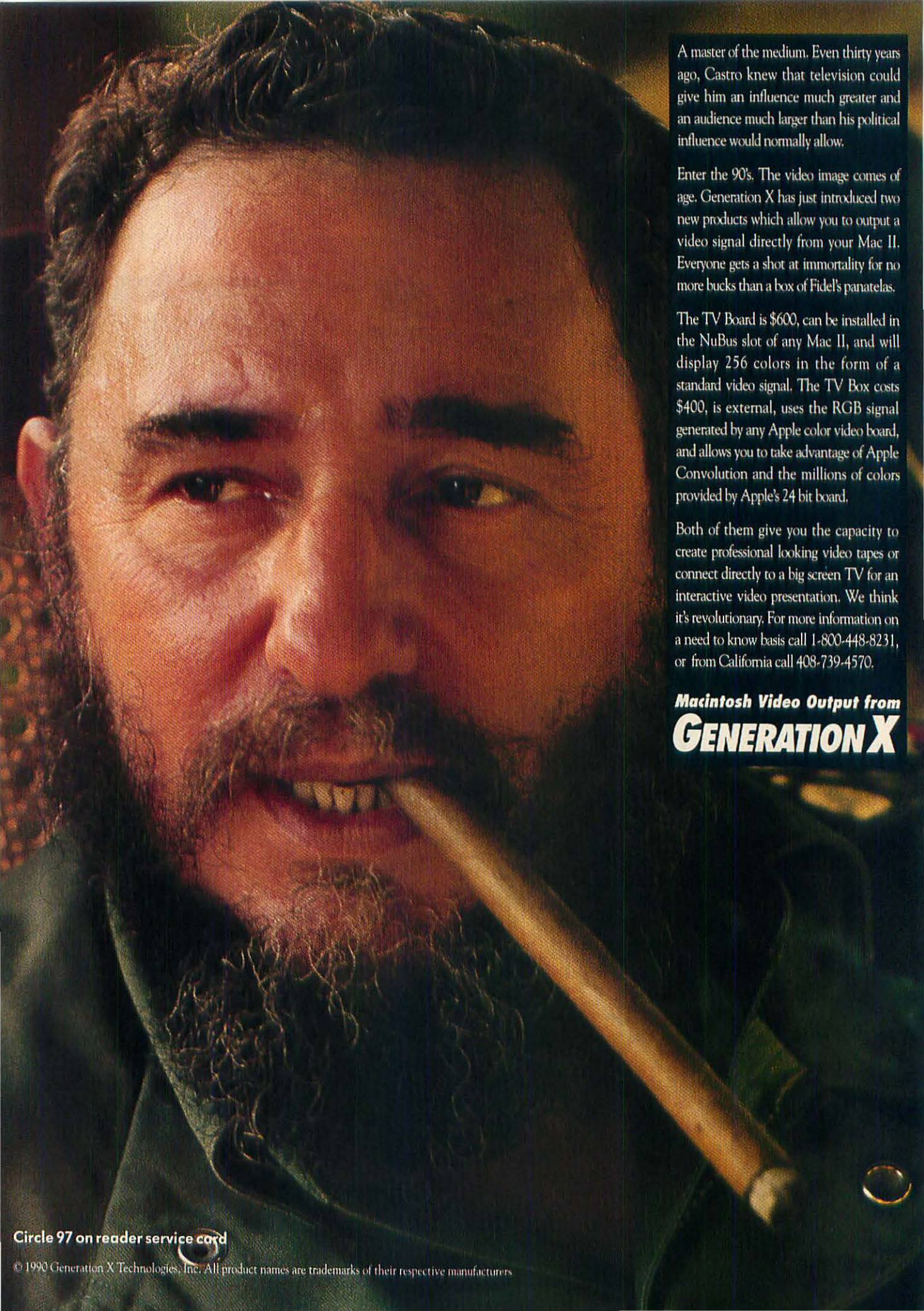
Hours: Mon-Fri 9am-10pm
Saturday 9am-6pm EST

1 CDA Plaza, P.O. Box 533
Califon, New Jersey 07830

Complete Macintosh Solutions
CDA Computer Sales

Prices subject to change without notice. Apple is a registered trademark of Apple Computer Inc. CDA is not an authorized Apple dealer. Product names are trademarks or registered trademarks of their respective companies

Circle 32 on reader service card



A master of the medium. Even thirty years ago, Castro knew that television could give him an influence much greater and an audience much larger than his political influence would normally allow.

Enter the 90's. The video image comes of age. Generation X has just introduced two new products which allow you to output a video signal directly from your Mac II. Everyone gets a shot at immortality for no more bucks than a box of Fidel's panatelas.

The TV Board is \$600, can be installed in the NuBus slot of any Mac II, and will display 256 colors in the form of a standard video signal. The TV Box costs \$400, is external, uses the RGB signal generated by any Apple color video board, and allows you to take advantage of Apple Convolution and the millions of colors provided by Apple's 24 bit board.

Both of them give you the capacity to create professional looking video tapes or connect directly to a big screen TV for an interactive video presentation. We think it's revolutionary. For more information on a need to know basis call 1-800-448-8231, or from California call 408-739-4570.

Macintosh Video Output from
GENERATION X

Circle 97 on reader service card


© 1990 Generation X Technologies, Inc. All product names are trademarks of their respective manufacturers



MACWORLD NEWS

by Dan Littman and Tom Moran

The Return of Illustrator

 Adobe Illustrator is getting a long-awaited upgrade. Illustrator version 3.0 has a simpler, less modal interface, built-in chart-making tools, and greatly improved text features.

You can enter and edit text directly on an illustration without going through a dialog box. Text blocks have no size limit; can contain any mix of fonts, sizes, and styles; and support kerning, tracking, leading, and other precise typographical controls. You can convert Type 1 fonts to outlines to modify letters as Bezier curves; you can flow text into columns, inside a series of linked objects, or attached to a curved path.

Version 3.0 generates a variety of bar, line, area, scatter, and pie charts from numbers you import or type into a table. It provides none of the number-manipulation features of other graphing tools such as DeltaGraph or KaleidaGraph, but it can transpose rows and columns and lets you set the scale—for example, one head in a population graph can represent 1000 people or 1 million. You can save a graph as a template and apply it to a different set of numbers.

In Illustrator 3.0 you can select and edit single objects in a group without ungrouping; add points to or remove points from a curve; grab and manipulate bezier curves directly; and convert corner points to smooth points, largely eliminating the need for the tedious scissors tool.

Aldus FreeHand 2 still has it over Illustrator 3.0 in a few areas. Illustrator does not permit drawing in the preview window, requires using the Blend tool to create even simple foun-



Enjoying a sunny day in Silicon Valley: the Adobe Illustrator 3.0 team (left to right) includes Rudi Sherry, Richard Cohn, Joe Holt, Teri Pettit, and Bruce Hodge.

tains, and cannot import TIFF files as templates or art (it will import EPS files and incorporate them in a final piece).

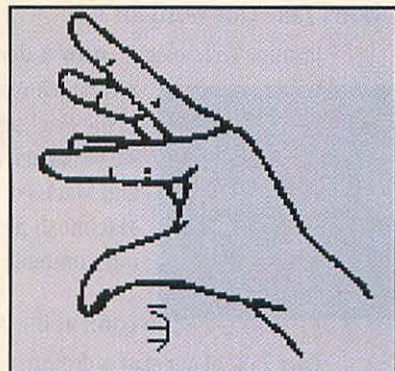
Illustrator 3.0 should ship in September. It will list for \$595 and require two megabytes of memory. ATM and Separator 3.0 will be bundled with it. For more information, contact Adobe Systems in Mountain View, California, at 415/961-4400.—D.L.

Animation for Sign Language



Advances in computers that can generate speech—and respond to it as well—are giving the visually impaired access to computers and all the information they make available. But barriers for the hearing impaired, who often have difficulty learning to read, have been

slower to fall. A group of linguists at the Center for Sign Language and Communication of the Deaf at Hamburg University in West Germany have been working on this problem for ten years, first documenting the grammar of sign language, then developing a (continues)



A sign in HamNoSys with its character from the HamNoSys font just below the thumb.

More Drive!

Look at our features

A LED indicator lets you know what your drive is doing at all times.

Our drives are cooled, shielded from power surges, and protected from dust with our Data Protection System (DPS), integral fan and filter.

DriveWare™ provides true SCSI partitioning, password protection, and powerful diagnostics.

SUM II protects your data in the unlikely event that your drive has problems.

Shareware/Demoware a large selection of useful and current programs and utilities.

An internal power supply fuse, and a user changeable power line fuse.

Two surge protected AC outlets, keep your data safe and your mind at ease.

A SCSI select switch lets you change your ID by pushing one button.

The Jasmine Edge

With Jasmine's features you get **More** for **Less**. A 20 ms average access time, 70,000 hour mean time between failures, extensive protection from environmental hazards and power problems and a push button SCSI Select Switch. You have 30 days to return your Drive for a full refund and a 2 year repair warranty.

Don't Take Our Word for it...

Jasmine Technologies, **now a division of Chess, SA**, has consistently finished first in the MacUser Labs' Buyers guide. We've earned more MacWorld and MacUser awards for top Macintosh peripherals than all our competitors combined.



Look at the Service...

Over 25% of our staff is dedicated to Customer and Technical Support. Each Jasmine drive is shipped with

comprehensive manuals and informative troubleshooting guides to help with any problems you may experience.

Now, Consider the Alternatives.

Our competition tries to mimic our

superior design (and even our advertising) but they can't match us. We've set the standards! So don't trust your important data with an imitation. You deserve More!

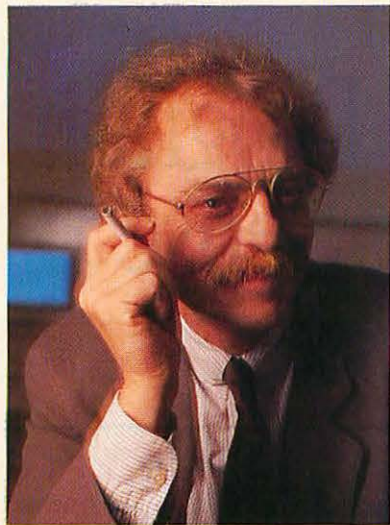
Capacity	Price
40 MB	\$ 599
80 MB	\$ 849
100 MB	\$ 999
130 MB	\$1199
180 MB	\$1499



Jasmine

To Order with Your Visa or MasterCard, Call

1-800-347-3228



MARTIN BRANDIS

Rolf Schulmeister, Hamburg University linguist, programmer, and sign language expert.

standard method to transcribe sign language, and now designing a set of HyperCard-based tools for recording and animating sign, building dictionaries, and converting between sign language and text.

Since sign language is neither phonetic nor character based, it requires a new kind of alphabet. The Hamburg Notation System (HamNoSys) uses about 200 symbols to indicate the shape of the hand, its position, spatial location, and movement, all of which are represented with a special font. Primary programmer Rolf Schulmeister says *mimics*, or commonly used facial gestures, vary so widely by country that it will be much more difficult to incorporate them; but extensions to give HamNoSys some mimics capability are in development. For those who haven't mastered HamNoSys, the HamNoSys Editor simplifies transcribing sign by leading you through each step.

A second tool called HANDS (Hamburg Animated Dictionary of Sign Language) can animate transcribed words by arranging a sequence of images from a picture database and playing them under VideoWorks to animate a person's head, body, upper arms, lower arms, and hands. Hearing people can use HamNoSys and HANDS to learn sign language, while the deaf can use them for writing and for reading transcribed materials.

In Germany, where the process of converting universities into basic re-

search centers for industry has not proceeded as far as in this country, academics are not permitted to profit by government-funded research, so the team's product will be distributed at cost. The group plans to develop a system that understands grammar and can convert whole sentences; it also wants to develop a sign language E-mail system. Long-term plans call for a system that could transcribe sign language from a videotape. For more information, write Prof. Dr. Rolf Schulmeister, Universität Hamburg, IZHD, Sedanstrasse 19, D200 Hamburg 13, West Germany, or call him at 49-40-4123-3851 or 49-40-4123-3240.—D.L.

The Sound and the Graphics



The folks at Motorola who make the microprocessors that are the heart of every Mac, have come out with a chip that promises to merge sound and graphics in ways not possible before. The 96002 Media Engine is a digital-signal-processor chip with added I/O capability that allows it to act as a sound-and-graphics processor for multimedia and other applications. The chip can work with Motorola 68040, which has begun shipping, or with other microprocessors such as Intel's 80486.

The 96002, designed to produce compact-disc quality sound and graphics, can operate at a very hot 50

MFLOPS (million floating-point operations per second). Although it adds the floating-point math capability, the chip is basically a 32-bit version of Motorola's 56001 digital signal processor, which is used for digital audio devices and in the Next machine.

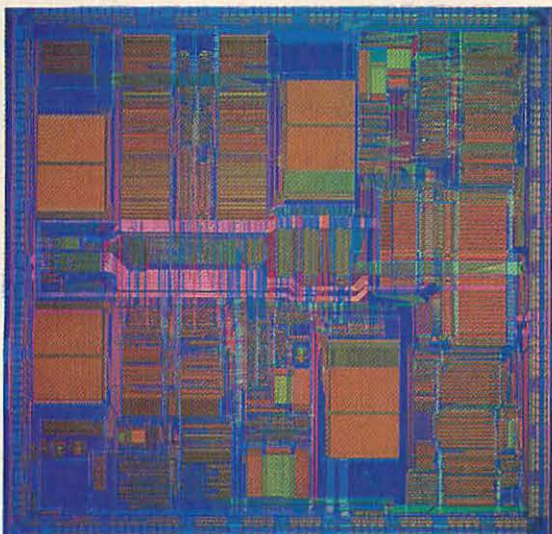
Expected applications include animation, 3-D graphics, compression and decompression of full-motion video, and image modeling. Several vendors are working on products containing the chip, including Ariel Corporation, which said it is shipping the MM-96, a board for the PC AT and compatibles that can hold one or two 96002 chips. The board, intended for scientific, industrial, or multimedia use, may also come out in a Mac version. For more information, contact Ariel Corporation, in Highland Park, New Jersey, at 201/249-2900.—T.M.

Islands in the Screen



Farallon Computing has brought out new versions of its Timbuktu and Timbuktu Remote screen-sharing programs, and has also introduced several hardware products for connecting Macs to Ethernet. The new Timbuktu, version 3.1, lets you see and control the desktops of several Macs at once, with each desktop appearing in a different window. Timbuktu connects to the other Macs via the LocalTalk network. Previously you could see the desktop of

only one other Mac. The new Timbuktu Remote, version 2.0, lets you see your own desktop in a resizable window while you control a second Mac over a modem. The previous version of Timbuktu Remote did not let you see your own desktop and the remote desktop at the same time. Timbuktu Remote 2.0 also adds a call-back feature for added security over the modem, and CCL scripting that lets you go through an in-



Photomicroscopic view of the 96002 Media Engine, a digital signal processor that handles graphics and sound.

(continues)

Since 1985, One Mac Accounting Program Has Made The Most Sense For Small Businesses.

If you've got a small business with under fifty employees, you want an accounting program that you can trust, one that has withstood the test of time. Since 1985, some 10,000 businesses have placed their trust in Business Sense.

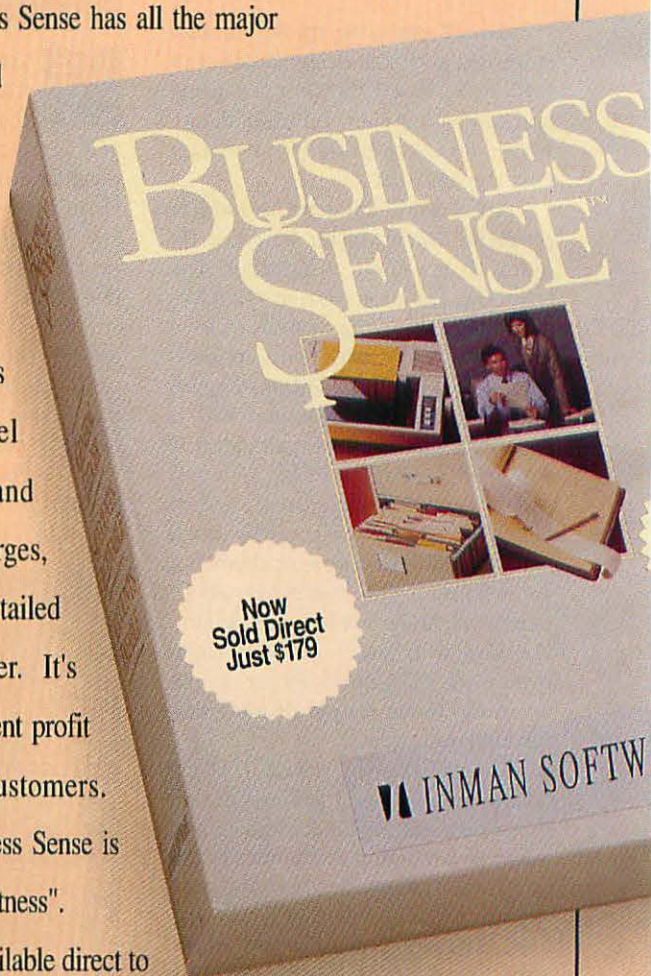
Unlike other programs with separate modules, Business Sense has all the major functions, including GL, AR, AP, Payroll, Budgeting and Invoicing, built into a single integrated program. Moving from one to another is as simple as pointing and clicking. Business Sense is intuitive and easy to use, because it was designed exclusively for the Mac.

Business Sense has every feature your small business might need including multi-level passwords, customer invoicing and statement generations, finance charges, full income and job cost reports, detailed account histories and general ledger. It's powerful enough to handle 99 different profit centers, 500 vendors and 2000 customers. MacUser Magazine said that Business Sense is "an excellent effort on the verge of greatness".

Feature Highlights

- Multiple journal windows
- Automatic posting of recurring entries
- Instant conversion of data to bar or pie chart
- 10 separate ship to addresses per customer
- Prints W-2s and 1099s, tracks sales commissions and multiple tax rates
- Detailed account histories
- Multiple bank accounts
- Automatic posting for up to date books
- Prints checks on laserwriter or imagewriter printers
- Easy export capabilities.

Business Sense is an extraordinary bargain and is now available direct to the end user at just \$179 including a 30 day, no questions asked, money back guarantee. A complete fully functional demo disk is available for just \$10. All you have to do is give us a call today at 307-789-7257. MasterCard and Visa are accepted.



INMAN



house digital phone switch or PBX.

Farallon also introduced a LocalTalk star controller called the PhoneNet StarController Series 300, and the StarController EN Series 500, an Ethernet hub that uses inexpensive twisted-pair wire. The 12-port Series 300 is easier to install than the Black Beauty StarController that it replaces, and it can both detect and clear jammed ports. The Series 500, which also has 12 ports, runs Ethernet at 10 megabits per second and complies with the 10Base-T Ethernet standard. Both network controllers come with Farallon's StarCommand network-management software, which monitors the network while running in the background.

Timbuktu 3.1 is currently available and lists for \$149. Timbuktu Remote 2.0 was expected to begin shipping in late June or early July at a suggested list price of \$195, the same as the previous version. Upgrades to the new Timbuktu Remote will cost \$50 for the first copy and \$5 for each additional serial number. The StarController Series 300 is shipping at a list price of \$1295. The StarController EN Series 500, also available, lists for \$2495. For more information, contact Farallon in Emeryville, California, at 415/596-9100.—T.M.

FilmMaker Puts It in the Can

Advent Computer Products is distributing FilmMaker, an animation and presentation package originally published in France by Arborecence. FilmMaker combines many of MacroMind Director's animation tools with rendering and presentation features.

Like Director 2.0, FilmMaker can composite animated images, import PICT or PICS files, combine animation with sound, perform some interactive functions, and play animations in Hy-

perCard. But FilmMaker has some significant features not found in Director 2.0. It is actually a set of four applications (Animate, Color, Sound, and Present) and five utilities (FilmMaker DA, Mark, Picture Runtime, Sequence Runtime, and Sequence Transfer).

Animations are composed in Animate, color effects added in Color, sounds added in Sound, and the final presentation composed and played back in Present. The utilities perform a wide variety of functions, such as converting pictures from graphics applications into FilmMaker format and running animations inside HyperCard.

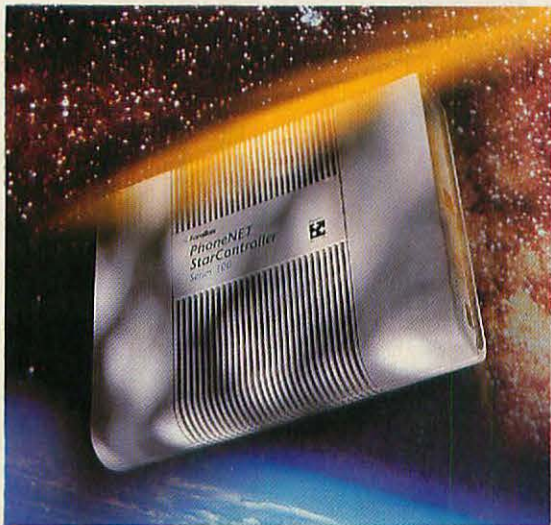
The Animate application supports numeric control of an object's location, rotation, and color. Animate also has rendering functions like antialiasing, dithering, and remapping. An outstanding feature is its ability to create parent-child relationships between objects. Like the three-dimensional modeling program Swivel 3/D Professional, objects can be linked so that they move together or in relation to each other. Unlike Swivel, linked objects in FilmMaker also share color changes, and the Tree window shows which objects are linked together.

The Color applica-

tion has an eyedropper tool for selecting and changing colors either one frame at a time or by groups of frames, to allow color effects like fades. Present is an object-oriented environment for linking animated sequences, transitions, and other parts of a presentation. It can create buttons and key commands that trigger transitions to the next element, and it can even open other applications and load their files.

FilmMaker ships in a metal film-reel canister for \$1995. It requires 5MB of RAM. For more information, call Advent Computer Products in Encinitas, California, at 619/942-8456.

—Jonathan Cassell



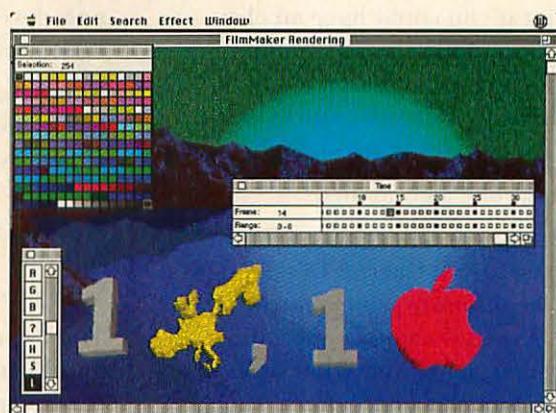
Farallon's PhoneNet StarController Series 300 connects and monitors up to 12 devices in a LocalTalk network.

A One-Mac Band



Composer-sculptor-inventor Trimpin suffers from allergies to brass and wood that forced him to stop holding brass and woodwind instruments to his mouth. No matter, though: he now plays brass, woodwinds, strings, and percussion instruments, not to mention garbage cans and clogs, with his Mac. For the past 15 years, he has been designing and building electromechanical devices that attach to acoustic instruments and play them in response to MIDI signals.

Trimpin descends from a long line of German inventors including—he is sorry to say—the one who, in the 1640s, created the first alarm clock. Trimpin's computer control of acoustic instruments opens realms of musical possibility, placing him at the fore-
(continues)



Getting ready for 1992: Arborecence used FilmMaker to prepare this animated presentation for Apple Europe.

The Ultimate

TYPIST

What if you could have an electronic assistant, capable of typing 500 words per minute, while sitting quietly at your side, and taking up no more space than a telephone?

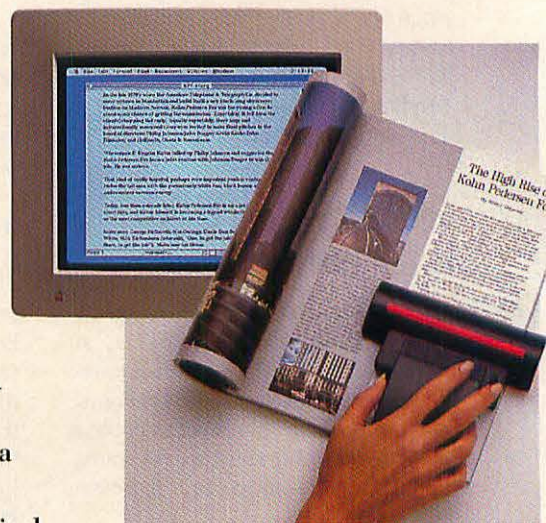
Sound like a great idea?

That idea is now reality with the *Typist*™ from Caere.® Designed to be *the ultimate typing machine*, the *Typist* is capable of reading any text, no matter what style font, font size or column format, and entering it directly into your Macintosh® or PC compatible word processor, spreadsheet or

database – without interruption. Caere, the company that pioneered Page Recognition with *OmniPage*® has now developed the world's most personal scanner.

The *Typist* works like your own personal assistant, capable of typing 500 words per minute – as well as numbers – entering it directly into your software application just like a keyboard – only faster.

The *Typist* is more than a typical hand scanner, generally suited to scan graphic images, but limited when it comes to text. As the world's most personal scanner, the *Typist* is a sleek, ergonomically



The Typist lets you accurately insert text or numbers directly into a PC compatible or Macintosh word processor, spreadsheet or database – simulating keystrokes effortlessly.

Typing Machine.™

designed peripheral that requires no special training or expertise. Select text or columns of numbers from any document, and the *Typist* enters your selection directly into your word processor or spreadsheet in whatever format you happen to be using – fully simulating your keyboard in every way. Scan up to 2 column inches per second, and the *Typist* will stay fully aligned – even when you scan rows and columns *sideways*. Think of the possibilities.

Use the *Typist* as your very own *personal* assistant. Enter rows and columns of numbers from business journals or periodicals, directly into your most critical documents,

including spreadsheets. Develop business reports, presentations, legal contracts, or desktop published documents in a fraction of the time. Further enhance your reports and presentations by incorporating graphics or photo images – the *Typist* makes it easy – improving your productivity whatever the assignment.

To learn more about the *Typist* and how it can be of assistance to you, contact one of Caere's participating dealers. Caere, the Complete Recognition Company.



For more information:

Call: 1-800-535-SCAN

**Write: Caere Corporation
100 Cooper Court
Los Gatos, CA 95030**

CAERE®

Caere, OmniPage and the Caere logo are registered trademarks of Caere Corporation. Typist, AnyFont technology and The Ultimate Typing Machine are trademarks of Caere Corporation. Macintosh is a registered trademark of Apple Computer, Inc. Printed in the USA. All rights reserved. ©1990 Caere Corporation.

Circle 230 on reader service card

Best Performer!



FoxBASE+/Mac: The Most Celebrated Mac DBMS Now Includes a Powerful Report Writer!

**New
Version 2.00!**

New FoxBASE+/Mac Version 2.00 is here—and stealing the show! In its first year, FoxBASE+/Mac won more awards—both in the U.S. and Europe—than any other DBMS ever created for the Macintosh! And Version 2.00 is faster and more powerful than ever—packed with innovative new features and language enhancements!

New FoxReport!

FoxReport lets you create virtually any columnar or free-form report—without any programming! FoxReport includes:

- **Page Layout:** Designate many layout settings for your report: number of columns, left margin setting, column width, space between columns, measurement size for each page, and more!
- **Report Layout Window:** Define the different areas within your report, using FoxReport's new "band" system. Start with the default bands: Page Header, Body, and Page

Footer, then bring in other bands like Title, Summary, Column Headers and Footers, etc.

- **Object Menu:** Control the Type Font, Sizes and Styles of text objects. Fill and Pen options let you change the color and shading of almost every object!
- **Page Preview:** "What-You-See-Is-What-You-Get" design ensures that the report on your screen is *exactly* as it will appear in print!
- **Label Generator:** Create labels of almost any size and configuration. You can even include pictures *anywhere* on the label space!

New Features!

- **Enhanced XCMD/XFCN Support:** Load up to 16 external XCMD's and XFCN's, then access them directly from within FoxBASE+/Mac 2.00 programs!
- **Language Enhancements:** Other features include: support for custom hierarchical menus, new commands to help handle resources, new system functions to improve filename and screen management, and much more!

Perfect Connectivity!

FoxBASE+/Mac 2.00's Multi-User version allows complete data and application sharing between networked Macs and PCs! (when used with FoxBASE+/LAN). It also runs on the most popular network systems: AppleShare, Novell and 3Com! . . . *And It's Faster Than Ever!*

Order or Upgrade Now!

FoxBASE+/Mac Version 2.00 is the *new* Leader of the Mac! And at only \$495 (\$695 for Multi-User), it's a phenomenal bargain! If you're already a FoxBASE+/Mac registered user, you can upgrade to Version 2.00 for just \$75!

To order your copy (or ask for a *FREE* demo disk), call (419) 874-0162. Or visit your local quality software dealer.

After all, when it comes to the Macintosh, *Nothing Runs Like a Fox!*

FoxBASE, FoxBASE+/Mac, and FoxReport are trademarks of Fox Software. Macintosh is a trademark of Apple Computer, Inc.

Fox Software

Fox Software, Inc.
134 W. South Boundary
Perrysburg, OH 43551

(419) 874-0162, Ext. 650
Fax: (419) 874-8678
Telex: 6503040827 Fox

Circle 152 on reader service card

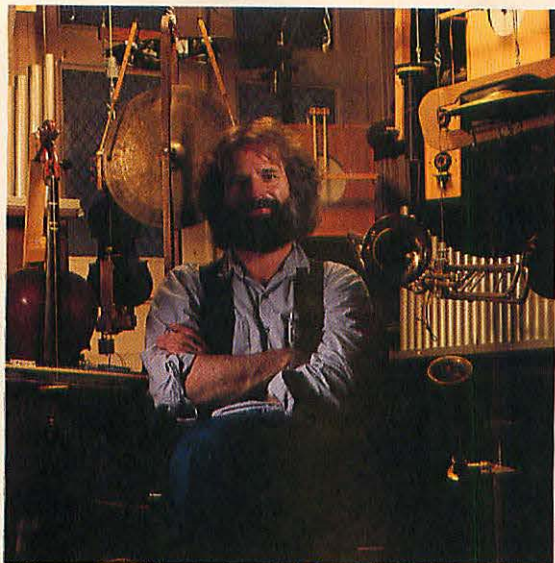
See Us at MacWorld Expo Boston, Booth #922 Bayside



front of a musical avant-garde. Until now, so-called computer music has been played on synthesizers. Acoustic instruments have been played alongside or interactively with computers, but not by computers.

Using the Mac, Trimpin controls his orchestras as no human conductor can. For example, he can play an unlimited number of tempos at once, and can synchronize instruments exactly. Exact synchronization is critical for creating the resonant effect essential to his compositions. He can also play each of his instruments beyond human capability—using 20-note chords, for example, or playing at superhuman speeds.

Trimpin automated acoustic instruments, instead of working with synthesizers, because of the former's resonant qualities. He refers to his compositions as psycho-acoustic—written with human perceptual facul-



Composer-inventor Trimpin has designed circuit boards and mechanisms for playing a host of acoustic instruments.

ties in mind—and one of his main interests is the way sound moves through space. He arranges instruments in a circle, with the audience in the center, in order to make sound travel in different directions around the room. He can, for example, play a theme in the left-front corner of a room, expand it in the left-rear corner, play an opposing, contrapuntal motif across the back wall on a different set of instruments, play with echo effects, or make a single sound seem to move.

Trimpin uses various Macs with Mark of the Unicorn's Performer (MIDI software). He designed the boards for his electromechanically modified instruments, using 6809 CPUs, custom-coded EPROMs, UARTs (communications protocol chips), and VIAs (versatile interface adapters). He has also invented input devices, including a light-sensitive one that he uses to compose. The device senses the shadow of his hand interrupting the light.

As yet, Trimpin has no interest in recording, he says, because current recording technology cannot duplicate the acoustic elements of his compositions. Instead, he performs live and creates sound sculptures. In 1990–1991, he and/or his work will be at the Los Angeles Arts Festival; Seattle's Bumpershoot Festival; the Banff Center for the Arts; Minneapolis's Walker Art Center; New York's Hall

of Science; the Portland, Oregon, Art Institute; Vancouver New Music; and San Francisco's New Langton Arts.
—Ann Garrison

Minitab Makes the Mac



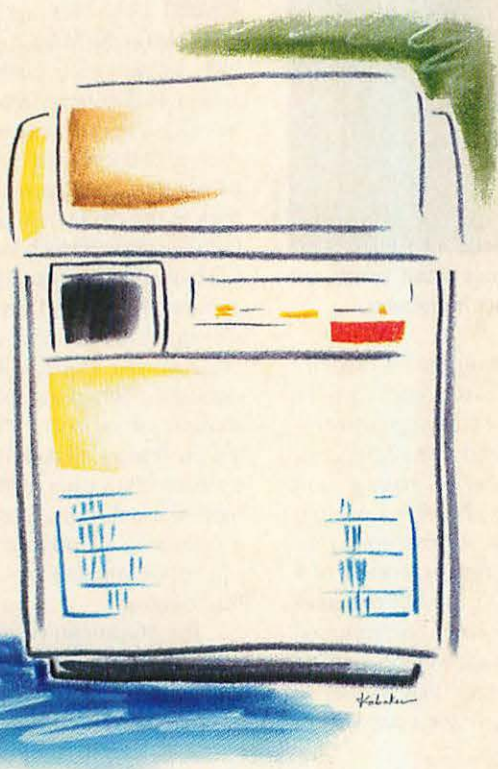
Minitab is a statistical software package developed in the 1970s for mainframes, now available on the Macintosh. It was originally targeted for statistics students and lacked some advanced capabilities found in other statistical packages such as SPSS. Minitab was popular for its easy-to-learn interactive approach back in the days when most statistical packages were largely batch oriented. Current releases of Minitab have much-enhanced statistical capabilities, and the application is now used by many professionals, though it still lacks some significant functions, particularly for analysis of variance. The program's macro feature makes it possible for users to fill in gaps in Minitab's capabilities, and the Mac version ships with a collection of popular macros that run inside Minitab or under Apple's MacroMaker.

The Macintosh version of Minitab is a complete replication of the mainframe package, including support for its limited, mainframe-oriented graphics tools. People familiar with Minitab will be able to use the Mac version immediately, and extensive online help files are available in case you need to brush up on anything.

Minitab barely uses the Macintosh interface. Only a few basic commands, mostly for importing and exporting data, appear on the menu bar. Even text files created by Minitab require a separate application for editing (miniWriter, a text-editor desk accessory, is included for this purpose). Still, despite its command-line nature, Minitab remains remarkably easy to use, thanks in part to its relatively simple language. Once you become familiar with the language, you may even find it simpler and quicker than more Mac-like statistics packages. But users wanting a more typical Macintosh approach will probably prefer programs like StatView, and users wanting the most complete set of features will probably
(continues)



One of Trimpin's instruments, converted to play under Macintosh control.



LOTS OF MACHINES SET IMAGES. ONLY ONE SETS THE STANDARD.

Suddenly, the market seems to be flooded with companies selling high-resolution PostScript® imagesetters.

And it seems that all of them promise the best features, the best performance, and the best price. In the midst of all these promises, we'd like to offer you a few simple facts.

Long before anyone else could even produce a high-resolution output device, thousands of Linotronic* imagesetters were helping people produce everything from newsletters to four-color ads like this one (which, by the way, was produced entirely on a Linotype system).

We're also the world's leading manufacturer of high-quality PostScript typefaces. And we offer the broadest range of complete prepress publishing solutions, backed by the industry's most experienced tech-support staff.

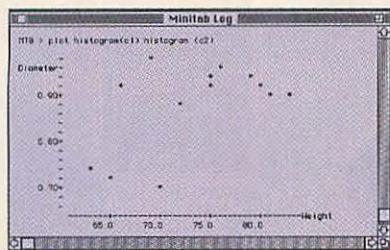
So if all you want is an imagesetter, you have lots of choices. But if you want to give your company the image it deserves, your choice is clear.

Call Linotype at 1-800-633-1900. In Canada, call 416-567-7111.

This ad was entirely produced on a Linotype Publishing System.

Linotype

SETTING THE STANDARD



Minitab's rudimentary graphing ability reveals the easy-to-learn statistical program's roots in the mainframe world.

prefer programs like Systat. Instructors using Minitab in their courses are likely to be first to welcome the Macintosh version, and eventually Minitab's publishers plan to give the program a true Mac interface.

Minitab lists for \$695 and comes in a version for the Plus and SE and one for the SE/30 and all Macintosh IIs. It requires a hard drive and 1MB of RAM. Those unfamiliar with Minitab can order documentation at extra cost (an order card comes in the box). For more information, contact Minitab in State College, Pennsylvania, at 814/238-3280.—**Ted Landau**

PostScript Prices Drop, Printers Get More Intelligent

The printer wars are heating up, with several vendors offering lower-cost PostScript printers. Among these are GCC Technologies, which has introduced PostScript versions of its popular PLP II and PLP IIS, and QMS, which announced its QMS-PS 410. The new GCC printers are the Business Laser Printer II (BLP II) and the Business Laser Printer IIS (BLP IIS).

GCC's BLP II prints 4 pages per minute and has a suggested list price of \$2299, while the BLP IIS produces 8 pages per minute and lists for \$2799. The QMS-PS 410 prints 4 pages per minute. At press

time, QMS had not finalized the printer's list price, but the company said its goal was \$2795, give or take \$100. The GCC printers actually use an LED-array-print engine from Oki to draw the page image on the print drum. The QMS-PS 410 uses the Canon LBP-LX laser-print engine.

The new GCC and QMS printers all have one serial port, one parallel port, and an AppleTalk connector. The QMS-PS 410 has an Emulation Sensing Processor that can tell whether a file is in PostScript, HPPCL (Hewlett-Packard Printer Control Language), or HPGL (Hewlett-Packard Graphic Language) format. HPPCL is used by HP's popular LaserJet family and many other PC printers. HPGL is most often used in plotters. Having sensed the type of file, the QMS-PS 410 automatically switches to the appropriate printer emulation.

The QMS-PS 410 was slated to begin shipping in July. The GCC printers were scheduled to be available beginning in June. Apple also planned to begin shipping in July its Personal LaserWriter NT, a 4-pages-per-minute PostScript printer with a list price expected to run about \$3300. (See "LaserWriters for Less," August 1990.) For more information, call GCC in Waltham, Massachusetts, at 800/422-7777, or QMS in Mobile, Alabama, at 205/633-4300.—**T.M.**



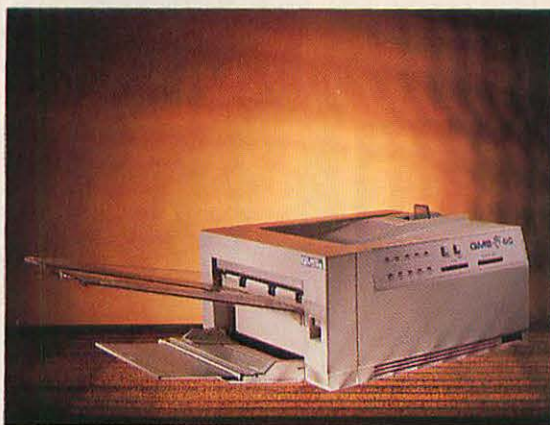
GCC Technologies' BLP IIS is an 8-pages-per-minute PostScript printer that carries a list price of \$2799.

Vector + Raster = Shapes



Shapes, a new program from Letraset, blurs the distinction between PostScript (vector-based) and bitmapped (raster-based) graphics. It also blurs the hard edges of PostScript graphics with an antialiasing feature, allowing you to output good-looking text and graphics on non-PostScript media, including color printers, film, and video.

Shapes adds a PostScript drawing layer to Letraset's ColorStudio. While ColorStudio's image and mask layers



The QMS-PS 410 can tell a Macintosh PostScript file from an HPPCL file generated by an IBM PC. It can print either.

are raster based, the layer added by Shapes is vector based; PostScript objects overlay the graphics in the other layers. Unlike other PostScript graphics programs, Shapes allows you to soften the edges of objects, a capability that should delight anyone who uses the Mac in video or film production, where antialiased text is a must.

In addition to improving the appearance of text, Shapes' antialiasing can eliminate the need for trapping, a problem that has plagued many who print color separations on the Mac. Since Shapes can soften the sharp line between two adjoining colors, a slight misalignment when printing won't cause the thin gap that sometimes appears between different ink colors.

Shapes is a PostScript RIP (raster image processor). When you print a ColorStudio document on a PostScript printer, the PostScript objects print as a PostScript overlay to the bitmapped image. When you print to a non-PostScript device, the PostScript objects (continues)



3-D SPREADSHEET



TIME/EXPENSE
MANAGER



SCIENTIFIC
CALCULATOR CARD



BOX JOCKEY
GAME CARD



32K/64K MEMORY
EXPANSION CARDS



NEW WIZARD SOFTWARE LETS YOU DO MORE THAN IS HUMANLY POSSIBLE.



8-LANGUAGE
TRANSLATOR



Like your PC, The Wizard electronic organizer from Sharp never forgets a name. Never misses a date. And makes short work of jobs that it's only human to postpone. But unlike your PC, The Wizard slips into your coat pocket. So it goes places most PCs can't.

But with an optional PC Link, your IBM® PC-compatible or Macintosh® personal computer will never be out of reach.

And with a growing library of optional software cards, The Wizard can up- and download numbers into Lotus 1-2-3® from its own 3-D Spreadsheet. Store up to 64K of data on a single card. Track your expenses. Tackle scientific equations.

Translate eight languages. Even play games. Yet despite all this power, it's humanly possible to master Wizard software quickly. Because these new programs are as easy to use as The Wizard itself. To find out where to see Wizard software in action, call 1-800-321-8877.



SHARP EXPANDS THE POWER OF THE WIZARD.

SHARP
FROM SHARP MINDS
COME SHARP PRODUCTS™



Letraset's Shapes is a drawing layer for ColorStudio that lets you soften the edges of PostScript graphics.

are blended with the bitmapped portion of the image. With Shapes, the same file can be rendered at different resolutions for a variety of output options. Files can be sent to non-PostScript devices, such as prepress systems, paintbox systems, film recorders, or video paintbox and animation systems such as the Quantel Harry workstation.

Other advantages of Shapes include varying levels of transparency for PostScript objects (translucent type, for example); smooth color blends; and faster printing by pre-rendering complex shapes or blends on a PostScript imagesetter. An auto-trace feature lets you convert graphics from ColorStudio's bitmapped layer into PostScript objects.

In the prerelease version, text couldn't be typed directly in Shapes, but had to be imported as an EPS outline. According to a Letraset representative, either the final version or a forthcoming update will offer the ability to type PostScript text directly.

Shapes will be available in the second quarter of 1990 and will sell for \$295 (free to anyone who purchased ColorStudio before June 1).

—Erfernt Fenton

Deep Contact



Those of you who attended Macworld Expo in San Francisco may have been amused, offended, or otherwise interested by a flyer for Virtual Valerie, a "multimedia sextravaganza" sold on CD ROM for \$95. "You've got a hot date with Val-

erie, your cybernetic fantasy," it teased. "But first, you'll have to find her! You begin on the street in front of her building and take it from there . . . until you meet Virtual Valerie for an erotic interlude!"

At the San Francisco Museum of Modern Art—only two blocks from the Expo hall where Virtual Valerie was for sale—you could have

seen another Mac-based interactive sex fantasy. There, in larger-than-life video, a woman dressed much like Valerie, in black miniskirt, low-cut bodice, and long satin gloves, beckoned to visitors.

"Touch me," she insisted, seductively. "Try and reach through the screen." If you touched her legs on the HyperCard screen, she led you into the garden, where the Woman in Red, the Zen Master, and the Demon appeared and then vanished through the trees. If you touched her hands, you'd be in the bar, where you could choose a character with whom to pursue an erotic fantasy. And if you touched her head, the artist, Lynn Hershman, appeared

to explain the game's intent: to explore the powerful intimacy of mass media, to consider its effect on who we are and the way we desire. (Not to mention what we order on CD ROM.)

Hershman created Deep Contact with a 12-inch interactive videodisc with color and sound, a Sony video projector, a video camera, a Pioneer 6000 videodisc player, a Macintosh IIcx computer, a Microtouch touch-sensitive screen, and a console pedestal. Sara Roberts of Lucasfilm wrote the HyperCard program and the drivers. Deep Contact will travel to New York's

International Center for Photography in 1991 and may travel to France and Canada later. For further information, call Lynn Hershman at 415/398-8055.

—Ann Garrison

Swivel Goes to Toontown



Bugs Bunny beware: personal computer animation has come of age. Using Paracomp's Swivel 3/D Professional, artists are creating high-quality computer animation for television commercials.

Swivel 3/D Professional is a new version of the three-dimensional modeler Swivel 3/D. Animators use Swivel for functions like linking, which joins objects so they move in relation to each other—useful for objects with moving parts, such as cartoon charac-



Sara Roberts of Lucasfilm (left) wrote the HyperCard scripts for artist Lynn Hershman's interactive sex fantasy.

ters. Animators also like Swivel's tweening, which creates still frames that can be turned into moving sequences in other applications.

Swivel 3/D Professional keeps the interface and functions of the old version, but adds new output formats including 24-bit PICT and AutoCAD DXF, as well as RenderMan, which is emerging as the standard for high-quality shading and texturing (see "Get Realistic," *Macworld*, June 1990). Professional's rendering functions include smooth (Phong) shading, lighting with (continues)

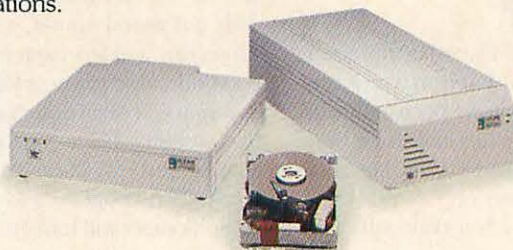


The only thing stopping you now is your imagination.

Just imagine a hard drive for the Macintosh line of computers that lets you spend less time waiting and more time creating. A drive that maximizes your computer capabilities and makes fast work of database management, desktop publishing and computer-aided design. A drive that can connect your network in a flash, and be very reliable. It's not a dream. Rodime Systems' Cobra Series offers access times as low as 14.5 milliseconds and storage as high as 650MB. And up to 48K of look-ahead caching to take advantage of the high performance of these drives. Cobra internal drives range from 45MB to 210MB while our external Cobra drives go from 45MB to 650MB. So, you can work with a long list of advanced software applications.

If you can imagine it, Rodime Systems Cobra Series can help you achieve it. Call us today at 407-994-5585. We'll put your imagination to work.

Circle 149 on reader service card





up to eight sources, and a material editor that can create color and reflection effects on surfaces. Professional also adds 24-bit full-screen display.

Jim Ludtke, a New York free-lance artist, used Professional to create a 3-D cartoon character in a commercial spot for Nabisco and Nintendo. In the spot, a cartoon Mario brother (from the Nintendo game "Mario Brothers") bounds across the TV screen with a mob of real kids in hot pursuit.

To create the cartoon character, Ludtke drew in Mario's component parts separately and then joined them with Professional's linking feature. Ludtke smooth-shaded Mario with Swivel's plastic material to give the character a fleshy look, and, for a final touch, he used the light panel to illuminate Mario with three light sources, enhancing the 3-D effect.

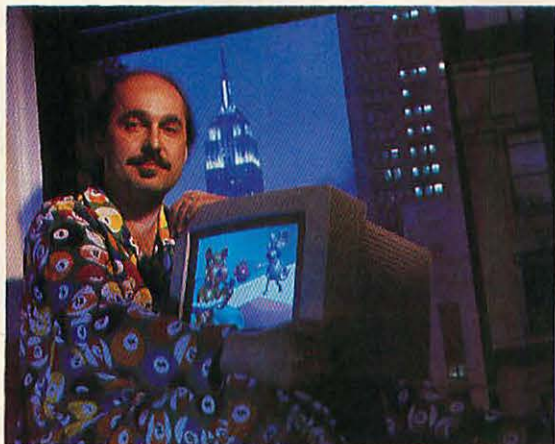
To animate Mario, Ludtke tweened frames of the character in motion, saved them in the PICS animation file format, and exported them to MacroMind Director 2.0 for sequencing into an animated segment. He then connected his Mac to a Quantel Harry workstation for final editing and export to videotape.

Swivel 3/D Professional lists for \$695. For more information contact Paracomp in San Francisco at 415/956-4091.—Jonathan Cassell

Object-Oriented Paint



As object-oriented programming (OOP) establishes itself with developers, its modularity and its class-and-inheritance structure are affecting the design and functionality of applications. VideoPaint, which was created in France and first marketed in this country as Graphist-Paint, is being upgraded to a 32-bit program that serves as a good example of an OOA (object-oriented application—pronounced ooh-aah).



Jim Ludtke has been known to wear pj's and enjoy the New York skyline while creating animations for network television.

VideoPaint Professional separates its tools and their attributes so that any tool can be modified almost beyond recognition and its attributes assigned to a different tool. For example, using VideoPaint Professional's incrustation feature and its support for links between documents, you might trace over an oval object in a painting and let a glimmer of another painting show through inside the oval; you could then assign the resulting image to the paintbrush to build up your montage, or convert the degree of incrustation to a filter and use it in some unrelated way.

VideoPaint Professional's programmer Eric Wenger says the new version will match the capabilities of the non-Mac video-titling software Types; support antialiasing, lighting, and RenderMan-like shading (but not RIBS import); and implement an odd selection scheme in which each corner of a selection is a different tool.



A hole cut out of one VideoPaint Professional collage can be a window into another image underneath it.

Like CA-Cricket Paint's FreshPaint feature, any altered selection in VideoPaint remains live until you deselect it, but unlike FreshPaint, you can use all VideoPaint features on a selection. With VideoPaint's simple macro-recording capability you can save a mask to reselect an area; and tool palettes and other user-defined features can also be saved as macros, in effect making VideoPaint a paint-application generator.

VideoPaint Professional's macros will be upgraded later to make the FreshPaint-like feature obsolete: the ability to automatically convert bitmap images to vectors and to store the vectorizations with time information will give VideoPaint an efficient animation tool that can double as an infinite undo. If you don't like something in a painting, just play it backwards to the point where you got off the track, make a correction, and reapply your later work.

VideoPaint Professional will list for either \$595 or \$695, and upgrades from the current version will be less than \$200. For more information, contact Olduvai in Coral Gables, Florida, at 305/665-4665.—D.L.

Making Media



Multimedia is about to get easier. Mixing video footage, CD music, and Mac animation to wow people with impressive presentations and demos sounds great, but doing it—which normally requires scripting in HyperCard—can be a real chore. MacroMind's new MediaMaker

reduces cuing and running all your devices to pushing a few *picons*—picture icons (icons containing images taken from the clip they represent)—about on a time line, almost like previewing slides on a light table.

MediaMaker has two environments. In the Collections environment, you create databases of clips from any device that (continues)

It's 9:01. And it's do-or-die.

All 5 offices of Venture Vessels have just 10 minutes to finish a presentation. Together.



San Francisco



Los Angeles



Newport



Philadelphia



Sydney

It's 9:05.

For a moment, things run aground. Philadelphia points out a need for another sail. And, thanks to Aspects, they're able to alter the graphic right there for everyone to see.



San Francisco



Los Angeles



Newport



Philadelphia



Sydney

It's 9:10.

The conference breezes right along with text contributions made together by San Francisco, Los Angeles and Newport. And everybody agrees—the presentation is ready to set sail.



San Francisco



Los Angeles



Newport



Philadelphia



Sydney

Introducing Aspects, the first simultaneous conference software for the Macintosh.

No matter what your group project, Aspects™ gives you a visual dimension to communication. Whether you're across a continent or merely across the hall, you now have the power to develop ideas through the exchange of words and images, without leaving your desk. Imagine. Now hold interactive meetings with up to 16 Macintosh® users, in real-time. And save thousands of dollars in time and travel expenses.

Create a meeting of the minds.

Everyone can actively participate in an Aspects conference—at the same time. They can write text. Create graphics. Insert material from their own files. While

everyone else in the conference watches. And the exchange of ideas is a fast-flowing, natural process. Giving on-line work new levels of vision and cooperation. You might say that Aspects lets one Macintosh user dot the i's, while the other crosses the t's. Literally.

Seeing is believing.

Call 1-800-476-8781 now for an Aspects demonstration video (just \$9.95 for shipping and handling), and the name of the Aspects dealer nearest you.



Macintosh is a registered trademark of Apple Computer, Inc. Group Technologies and Aspects are trademarks of Group Technologies, Inc.
©1990 Group Technologies, Inc.

Circle 117 on reader service card



File Edit View

Special

Macworld
Savings!

49% Off

YES! Please send me a year (12 issues) of MACWORLD for only \$24.
That's almost 50% off the annual cover price of \$47.40.

Name _____

Company _____

Address _____

City / State / Zip _____

☐ Please bill me. ☐ Payment enclosed.

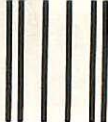
Allow 4-6 weeks for delivery of the first issue. Basic subscription price is \$30 for 12 issues. The cover price is \$3.95 per issue, \$47.40 annually. For Canada and Mexico, please add \$18 for shipping.

More

MAC-
power

For
You!

Save \$23.40



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

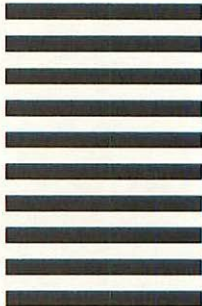
POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Subscription Department

P.O. Box 51666

Boulder, CO 80321-1666

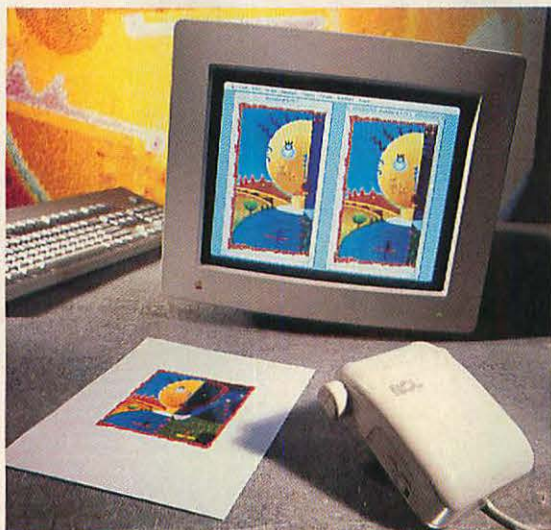




has a Mac driver (as well as native Mac files such as sounds, PICT files, and MacroMind Director animations), assign them to picons, and give each a text description. (The first version of MediaMaker can't search the text file but a later version will be able to.) MediaMaker provides tools for each format, for example, letting you advance a laser disc one frame at a time to mark exactly where you want a clip to begin.

In the Sequencer environment, you grab picons from collections and lay them out along a timeline. Each format has its own line, so a video picon can launch a laser-disc player at the same moment a sound picon starts a CD player. Picons contain only information about where a clip starts and stops or where a file is on your hard disk, so collections take up little disk space and can be created and sequenced on a Mac Plus or SE. Complete sequences can be played and written out to a video cassette.

MediaMaker is simple to understand and to use. It lacks special effects and editing tools like the Avid workstation or other time-domain editing systems, and cannot run outside applications that might be useful such as ScreenRecorder or HyperCard (later versions may have this ability;



ClearScan Color is a hand-held scanner that supports 512 colors and can merge several swaths into one image.

for now, it can call XCMDs or Director Xobjects for that purpose). It has only a bare minimum of user-definable events like waiting for a mouse-click or pausing for a specified period.

MediaMaker should ship in September and will probably list for \$395 or \$495. For more information, contact MacroMind in San Francisco at 415/442-0200.—D.L.

Color in the Palm of Your Hand



The first hand-held color scanner, the ClearScan Color from NCL America, has a palette of 512 colors and a resolution of 300 dpi. The ClearScan Color scans images in swaths that measure 2½ inches wide by 5 inches long. The scanner comes with a utility that helps merge several swaths into a single image. To help match the edges of the swaths, the software can enlarge the images while you're overlapping and merging them.

Although the palette contains 512 colors, the device stores the scanned image as a PICT2 file with 256 colors. Included edit-

ing software lets you rotate images, adjust the contrast, use special effects, or convert images from color to gray scale.

With a suggested list price of \$795, the device is not intended as a replacement for a flatbed scanner in high-use applications, but as a low-cost solution for the occasional or beginning user. The ClearScan Color was slated to ship in July. For more information, contact NCL America at 408/734-1006 or 800/521-0121.—T.M.

Musings on Natural Language



How people think about information and how computers operate on data are converging in a new area called natural language (NL) processing. Muse, the first natural-language application for the Macintosh, integrates relational database, spreadsheet, and graphing tools behind an interface that can interpret and execute typed requests like "compare and graph longevity in New England and the Deep South."

In the above example, Muse would search through your data files for census information, extract figures for the appropriate states, build a table, and then draw an appropriate graph, such as a bar chart. If your query were a bit more complex—for example, if you ask it to chart changes in longevity for the past 100 years—Muse would know to generate a 3-D graph or an animated bar chart.

The principles underlying earlier NL applications written for mainframes, as well as Muse, are based on the branch of linguistics called transformational-generative grammar. Because natural language, unlike the procedural languages native to computers, is inherently not calculable, natural language rules must be interpreted in the application's deep structure as calculable or algorithmic procedures, such as Boolean operators, lists, or arrays. Muse comes with several hundred transformational rules for converting between natural language and the underlying metalanguage, and this rule set is stored in an external database, making it possible for (continues)



Arranging bits and pieces of music, video, and other kinds of data on a time line in preparation for a presentation.

QUALITY TIME

*You Have Better Things To Do
Than Back Up*

If you can think of better ways to spend your time than backing up your hard disk, you need FastBack II or FastBack Tape. FastBack II is the world's fastest and most reliable backup software for the Macintosh.

FastBack Tape gives you a fast, ultra-reliable 120 megabyte tape drive, for the *ultimate* backup system. It even lets you schedule *automated, unattended backups* to take place whenever you choose. Even when you're otherwise occupied.

After all, you have better things to do.



Circle 522 on reader service card

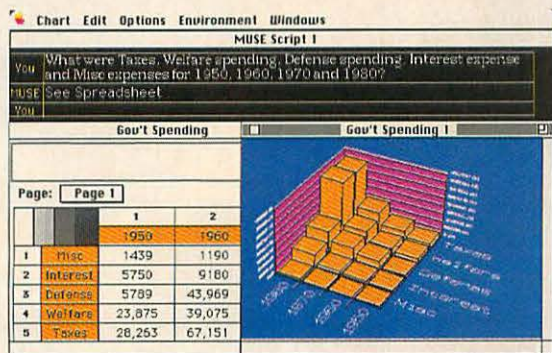
This product is in no way associated with or has origination in Fisher Scientific or Allied Corporation.



FIFTH GENERATION SYSTEMS

10049 N. Reiger Road Baton Rouge, LA 70809 (504) 291-7221

For a complete list of features and specifications, or the name of your nearest dealer, call 1-800-873-4384.



Muse understands the natural-language query in the top window, compiles a table, and creates a 3-D graph.

end users to add rules. For example, you can teach Muse what South America means by giving it a list of all the countries in that continent.

Muse queries can be saved as scripts and reused, so it is possible to build complete (though uncompiled) applications such as executive information systems, and Muse will present a dialog box whenever it needs the user to provide a variable, such as a search criterion. Occam Research says Muse's query language eliminates the need for standard Mac interface objects like buttons and menus in a custom database, though the company may add support for them anyway.

Future plans for Muse include a multiuser database, CL/1 compatibility, and speech recognition. Muse will be available to MIS departments and VARs in October and will go into general distribution in January at \$695. For more information, contact Occam Research in Watertown, Massachusetts, at 617/923-3545.—D.L.

I Want My Mac TV



RadiusTV, a peripheral that displays full-function television on the Mac II series, provides an image as large as 640 by 480 pixels on monitors up to 19 inches in diameter. Radius designed the RadiusTV as an external box so that it could incorporate a cable-ready TV tuner, real-time digitizer logic, and five interfaces to video sources. The interfaces include two RF connectors that can each accept a signal from a VCR, two composite video inputs, and one RGB channel that supports high-quality video devices, such as CCD cameras.

A high-speed cable links the external box to the RadiusTV's NuBus board inside the Mac.

RadiusTV supports 16 bits of color, about one bit less than the bandwidth of broadcast TV, but not enough less for the average viewer to notice the difference. It works with Radius 24-bit color adapter boards, which support the NuBus's high-speed block-transfer mode. Radius says there is nothing to prevent RadiusTV from working optimally with other 24-bit boards that support block-transfer mode. At press time, RasterOps Corporation had just announced the 8L Display Board and 24L Display Board, both of which support block transfer. Other display vendors are also working on 24-bit boards with block-transfer capability. RadiusTV

That information can be captions for the hearing impaired or ticker-tape data from CNN, for example.

The suggested retail price for RadiusTV will be under \$3000, according to Radius. The company expected to begin shipping in June. For more information, contact Radius in San Jose, California, at 408/434-1010.—T.M.

MapInfo to Chart New Territory



Software developers have taken advantage of the Macintosh's visual interface to simplify most kinds of computing tasks, but, curiously, mapping and manipulating geographical information—certainly one of the most inherently visual tasks a computer could be asked to perform—has been slow to take off on the Macintosh. That is beginning to change.

MapInfo, known for its DOS product of the same name, is developing a



Intended for video production, the RadiusTV external subsystem puts a 16-bit, full-motion TV window on a Mac II monitor and accepts input from a variety of video sources.

can function at a lower level with 8-bit boards.

RadiusTV's interface has all the usual TV controls plus autocalibration. Users can store RadiusTV images as PICT2 files. The sound is also digitized for storage. The device can capture and store as a text file any closed-caption information in the TV signal.

Mac version of MapInfo that, as company president Sean O'Sullivan describes it, is "a surface to databases." It is not a map-drawing package but instead a geographical information system (GIS), a tool for displaying and comparing information across a geographical area. For example, AT&T (continues)

A MAJOR PRODUCTION

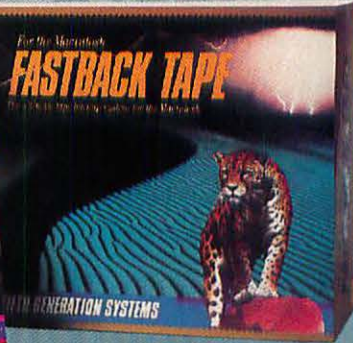
Backing Up Shouldn't Be!

You know you need to back up. In today's computing world, that's a fact of life.

But does backing up really have to be such a *big production*?

Not if you have FastBack II, the world's fastest and most reliable backup software for the Macintosh.

And for the *ultimate* backup system, combine FastBack Tape with a fast, ultra-reliable 120 megabyte tape drive. Just pop in a cartridge and schedule your backup to take place *automatically* and *unattended*, whenever you choose.



Which turns a major production into a very short subject.

Circle 521 on reader service card

This product is in no way associated with or has origination in Fisher Scientific or Allied Corporation.

FIFTH GENERATION SYSTEMS

10049 N. Reiger Road Baton Rouge, LA 70809 (504) 291-7221

For a complete list of features and specifications, or the name of your nearest dealer, call 1-800-873-4384.



uses MapInfo in its Call before You Dig program to provide exact descriptions of where not to dig based on surface features such as addresses, sewer holes, and road signs, and neurologists at Johns Hopkins University are even using MapInfo to map nerve pathways in the brain as they conduct tests with implanted electrodes.

MapInfo has three linked views into its information. Like any database,



CHUCK KNESE

Yvonne Leary uses MapInfo on a PC clone to match up Kansas City commuters who want to arrange car pools.

you can study, enter, or modify raw data in the browse view; in the map view you study and manipulate maps and information overlaid on them by your queries; and in the graph view the same data appears in bar charts and other formats. MapInfo can also read native-format FoxBase+/Mac and Microsoft Excel.

MapInfo's database engine is SQL, shielded with a friendly interface that provides excellent query tools and simplifies accessing data in larger databases and spreadsheets. It provides a query dialog box for simple queries and a second dialog box for complex queries—in the second dialog box, you can access the SQL code directly if you want to. MapInfo's SQL has an extended command set appropriate for geographical queries including *within*, *proximity*, and *perimeter*. MapInfo also supports entering topological data with a scanner and aligning it with maps.

MapInfo will list for \$695. For more information, contact MapInfo in Troy, New York, at 518/274-8673.—D.L.

Survey: High Expectations for Low-End Mac



This month's survey, which was mailed to 1000 subscribers, examines *Macworld* readers' expectations for the much-anticipated low-cost Mac. The survey, which 47.5 percent of our survey group responded to, indicates that the Macintosh community would be extremely receptive to a new inexpensive Macintosh.

A whopping 42.6 percent said that if the low-cost Mac met their expectations they would be extremely likely to buy it despite the fact that most of the respondents already own Macs. Another 21.7 percent said they would be very likely to buy the low-cost Mac. Other respondents were not so enthusiastic, with 19.6 percent saying they would be only somewhat likely to buy, and 15.1 percent responding that they would not be likely to buy.

As for what our readers expect from a low-cost Mac, 49.4 percent said they expect the price to be from \$500 to \$999—less than the list price of a Macintosh Plus; 25.5 percent said they

expect the price to be between \$1000 and \$1249; and 16.6 percent expect the price to be in the \$1250 to \$1499 range.

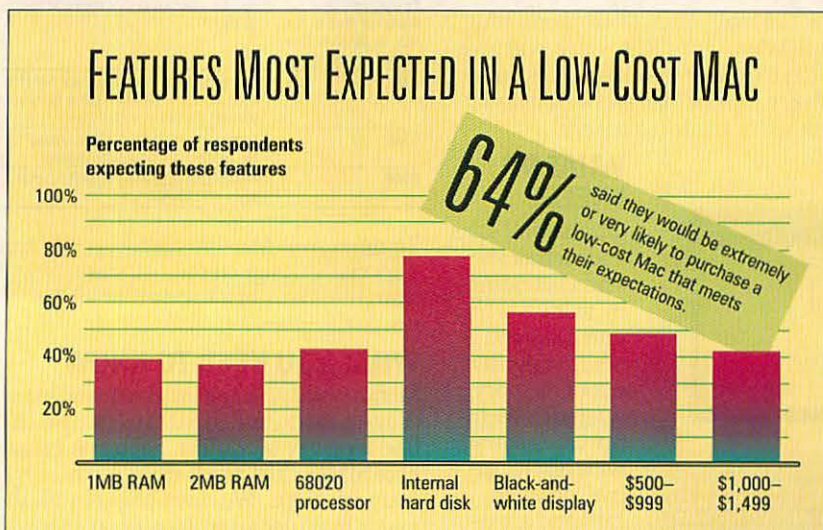
When asked how much memory they expected in the low-cost Mac, 39.4 percent said 1MB. Almost as many, 37.4 percent, said 2MB—indicating that many of our readers want the new Macintosh to be able to run System 7.0 with no memory upgrade (System 7.0 will require a minimum of 2MB). Only 14.3 percent said they expected 2.5MB.

As for the microprocessor, 43.2 percent said they expect a 68020 (the processor used in a Mac II), 29.4 percent said a 68000 (the processor used in a Mac Plus), and 25.5 percent said a 68030 (the processor used in the Mac IICx, IICi, and IIfx).

In the storage department, an overwhelming majority—77.4 percent—said they expected the low-cost Mac to be able to accommodate an internal hard disk. Most respondents did not expect the low-cost Mac to include a color display, with 57.2 percent saying they expect a black-and-white display, 28.3 percent saying gray scale, and only 14.3 percent saying color.

Finally, a slight majority said the low-cost Mac should not be modular—that is, should not have a separate system chassis and monitor—with 52.6 percent saying it should not, and 46.4 percent saying it should.

—Jonathan Cassell



In this month's survey 64 percent of responding readers said they would be either very likely or extremely likely to buy a low-cost Mac that met their expectations.

Tomorrow's Upgrade For Your Mac Is Only \$79*

FREE!
STEP-BY-STEP
VIDEO
INSTRUCTIONS**

A MacWarehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable, overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. Just open your Mac, slide out the main circuit board and plug in your SIMMs. Our FREE video will give you STEP-BY-STEP installation instructions. Every type of Mac is covered and we think we've made it a breeze.

WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@ \$79 each).

The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.
2½ MB	Remove only two 256K SIMMs, install two 1M SIMMs.
4 MB	Replace all four 256K SIMMs with four 1M SIMMs.
To upgrade an 8-socket Mac II, IIfx, IIfx, or SE30 to this amount of memory	Do this: (install in multiples of four only)
4 MB	Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets.
8 MB	Remove all four 256K SIMMs install eight 1M SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool — it's available from us as part of a handy tool kit for just \$9.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMs (Single In-line Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

Prices can vary a lot, based on quality, speed and demand. At press time

our price for 1MB, 120 ns SIMMs is \$79. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help make your choice an easy one.

SPEED

Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Place your order by 12:00a.m.(E), weekdays and we'll deliver overnight for just \$3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

MacWAREHOUSE™
1-800-255-6227

Call toll-free
Twenty-four hours a day,
seven days a week.
Inquiries 1-800-367-0440
Fax 1-800-905-9279
© Micro Warehouse Inc.

MACWAREHOUSE 30 DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your MacWarehouse Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return the product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

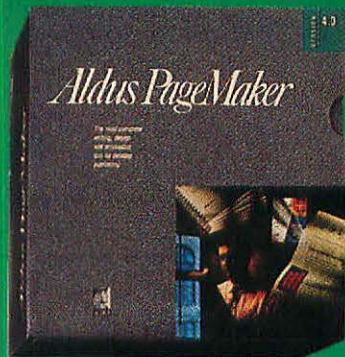
MWJØP

* SIMMs prices vary. Call for latest information.

** Limited Offer! Free video with purchase of 2 or more SIMMs.

Now available from MacWAREHOUSE—
with over 75 new features and enhancements!

Aldus PageMaker 4.0 for only \$499



Aldus PageMaker® is recognized worldwide as the most complete writing, design and production tool you can use to create professional-looking, high-quality publications. Version 4.0 puts even more power into this desktop publishing powerhouse with over 75 new enhancements and features.

Fully integrated word processing

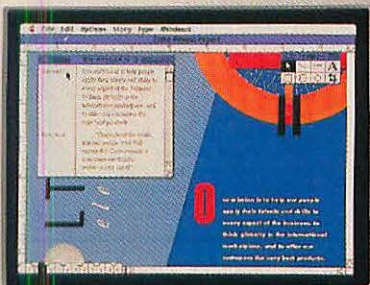
PageMaker 4.0 boasts an all-new Story Editor, with all the features you'd expect in a standalone word processor. Write and edit text with ease. Check spelling with the 100,000 word dictionary. Search and replace by characters, fonts, point sizes, and paragraph styles.

Complete control over type

With PageMaker 4.0, you have more flexibility than ever to make your publication look just the way you want it. Rotate text in 90-degree steps. Condense or expand type from 5-250 percent. Apply point size dependent track kerning, or kern over any range of text to within 0.01 of an em. You can assign type sizes from 4 to 650 points, set leading in increments of 0.1 of a point, or spread text evenly across a column or page.

Short steps for long documents

PageMaker 4.0 offers more time-saving and convenience features than ever before! You can generate tables of contents, compile indexes automatically, and edit them with ease. PageMaker 4.0 even lets you keep track of changes or update your publication with the most recent versions of text or graphics. For smooth movement around the page, graphic elements and ruled lines can be linked with specific text.



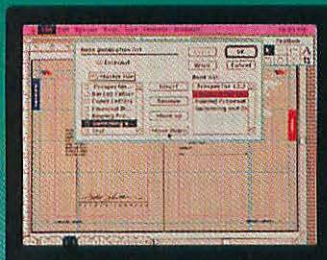
The STORY EDITOR features a full-functioned word processor with spelling checker.

Expanded color capabilities

PageMaker 4.0 imports and displays full-color images using 24-bit color TIFF and EPS graphics. Then choose RGB, HLS and CMYK, or even pick a Pantone® color for just the right shade or color you need. Combine PageMaker 4.0 with an OPI-compatible separator, such as Aldus PrePrint™ (available separately), and you can output your own process-color separations!

Easy to learn and use

With all these great features, you might think you need a college degree to get the most out of PageMaker 4.0. Wrong! In addition to its new on-line, context-sensitive help and 30 pre-designed templates, PageMaker 4.0 comes with a new modular tutorial and comprehensive documentation so you can learn at your own pace.



The BOOK option lets you combine and print multiple files for longer publications.



Type sizes can range from 4 to 650 points, and you can kern to within 0.01 of an em.

Overnight delivery only \$3.00!

PageMaker 4.0 is available now — and you can have it tomorrow. Just call our toll-free number by 12:00 midnight (E.S.T. weekdays) and we'll ship it to you overnight for only \$3.00. When it comes to getting the newest products at the best prices, nobody beats MacWAREHOUSE — nobody!

Aldus PageMaker 4.0

MacWAREHOUSE Low Price:\$499

Call 1-203-854-5300 for instant technical information FREE from your fax!
The FaxFACTS # for PageMaker 4.0 is 2505.

System Requirements: Mac Plus or higher; hard disk drive; 1 MB RAM; System 6.03 and Finder 6.1 or later; PostScript- or QuickDraw-compatible printer.

MacWAREHOUSE™

1-800-255-6227

Call 24 hours a day, 7 days a week MWJOL

©1990 Micro Warehouse Inc.

*Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. Aldus, the Aldus logo, and PageMaker are registered trademarks, and Aldus PrePrint is a trademark of Aldus Corporation.

The Font Specialist

Whether you're a professional graphic designer or a Mac user looking to improve a memo or presentation, you'll be delighted to choose from the mind-boggling variety of Adobe typefaces. And there's no need to scour the earth for your selection. MacWAREHOUSE carries the full library of Adobe

PostScript® typefaces for the Mac, including the newest additions. Choose from the fonts below or ask for a copy of our catalog. Order your fonts anytime up to 12:00 midnight, and we'll deliver overnight for just \$3.00. Remember, nobody beats MacWAREHOUSE for your font needs — nobody!

FON 0254 **Candida® Roman**
Candida Italic
Candida Bold **NEW!**

FON 0247 **Dom Casual**
Dom Casual Bold **NEW!**

FON 0236 **Franklin Gothic® No. 2 Roman**
Franklin Gothic Condensed
Franklin Gothic Extra Condensed **NEW!**

FON 0167 **Goudy Extra Bold**
Goudy Heavyface
Goudy Heavyface Italic

FON 0163 **Helvetica® Compressed**
Helvetica Extra Compressed
Helvetica Ultra Compressed

FON 0240 **Impressum® Roman**
Impressum Italic
Impressum Bold **NEW!**

FON 0078 **ITC American® Typewriter®**
Medium
ITC American Typewriter Bold
(Includes ITC Machine)

ITC MACHINE®
(Includes ITC American Typewriter)

FON 0248 **Kimtext®**
NEW!

FON 0171 **OCR-A** ABCDEFGHIJ2345
OCR-B ABCDEFGHIJ2345

FON 0243 **Post Antiqua®**
Post Antiqua Bold **NEW!**

FON 0146 **STENCIL**
(Includes Brush Script & Hobo)

Hobo
(Includes Brush Script & Stencil)

Brush Script
(Includes Hobo & Stencil)

FON 0281 **UMBRA**
(Includes Parisian) **NEW!**

Parisian
(Includes Umbra) **NEW!**

FON 0250 **Tempo® Heavy Condensed**
Tempo Heavy Condensed Italic
(Includes Gothic 13) **NEW!**

Gothic 13
(Includes Tempo)

Suggested Retail: \$145 **\$97**

FON 0251 **Berthold Akzidenz Grotesk® Light**
Berthold Akzidenz Grotesk Roman
Berthold Akzidenz Grotesk Bold
Berthold Akzidenz Grotesk Black **NEW!**

FON 0181 **Americana®**
Americana Italic
Americana Bold
Americana Extra Bold

FON 0198 **Antique Olive® Light**
Antique Olive
Antique Olive Italic
Antique Olive Bold
Antique Olive Black

FON 0256 **Arnold Böcklin**
(Includes Fette Fraktur, Helvetica Inserat & Present Script) **NEW!**

Fette Fraktur
(Includes Arnold Böcklin, Helvetica Inserat & Present Script) **NEW!**

Helvetica Inserat
(Includes Arnold Böcklin, Fette Fraktur & Present Script) **NEW!**

Present® Script
(Includes Arnold Böcklin, Fette Fraktur & Helvetica Inserat) **NEW!**

FON 0249 **Cochin®**
Cochin Italic
Cochin Bold
Cochin Bold Italic **NEW!**

FON 0246 **Folio® Light**
Folio Medium
Folio Bold
Folio Extra Bold
Folio Bold Condensed **NEW!**

FON 0193 **Garamond 3***
Garamond 3 Italic
Garamond 3 Bold
Garamond 3 Bold Italic

FON 0280 **Adobe Garamond Expert Collection™**
ADOBE GARAMOND EXPERT REGULAR
ADOBE GARAMOND EXPERT ITALIC **NEW!**
ADOBE GARAMOND EXPERT SEMIBOLD
ADOBE GARAMOND EXPERT SEMIBOLD ITALIC
ADOBE GARAMOND EXPERT BOLD
ADOBE GARAMOND EXPERT BOLD ITALIC
ADOBE GARAMOND TITLING CAPITALS
ADOBE GARAMOND ALTERNATE REGULAR
ADOBE GARAMOND ALTERNATE ITALIC

FON 0245 **Sabon® Roman**
Sabon Italic
Sabon Bold
Sabon Bold Italic **NEW!**

FON 0244 **VAG Rounded Thin**
VAG Rounded Light
VAG Rounded Bold
VAG Rounded Black **NEW!**

FON 0255 **Berthold Walbaum®**
Berthold Walbaum Italic
Berthold Walbaum Bold
Berthold Walbaum Bold Italic **NEW!**

Suggested Retail: \$185 **\$125**

FON 0147 **Aachen Bold**
(Includes Freestyle Script, Revue & University Roman)

Revue
(Includes Aachen Bold, Freestyle Script & University Roman)

University Roman
(Includes Aachen Bold, Freestyle Script & Revue)

Freestyle Script
(Includes Aachen Bold, Revue & University Roman)

FON 0118 **Bodoni**
Bodoni Italic
Bodoni Bold
Bodoni Bold Italic
Bodoni Poster

FON 0280 **TRAJAN® REGULAR**
TRAJAN BOLD
(Includes Charlemagne) **NEW!**

120 **CHARLEMAGNE® REGULAR**
CHARLEMAGNE BOLD **NEW!**

WHOLE TYPE I
FON 0289 **NEW!**
COTTONWOOD
ABCDEFGHIJKLMN O P
QRSTUVWXYZ & ! ? 1 2 3
FUNDRESSA
ABCDEFGHIJKLMN O P R S T U V W X Y Z & ! ? 1 2 3 4 5 6 7 8 9 0
IRONWOOD
ABCDEFGHIJKLMN O P R S T U V W X Y Z & ! ?
MESQUITE
ABCDEFGHIJKLMN O P R S T U V W X Y Z & ! ?
JUNIPER
ABCDEFGHIJKLMN O P Q
JENAMEN IS
Suggested Retail: \$185 **\$127**

FON 0157 **Eurostile®**
Eurostile Oblique
Eurostile Demi
Eurostile Demi Oblique
Eurostile Bold
Eurostile Bold Oblique

FON 0152 **Futura Light**
Futura Light Oblique
Futura Book
Futura Book Oblique
Futura Bold
Futura Bold Oblique

FON 0150 **Futura®**
Futura Oblique
Futura Heavy
Futura Heavy Oblique
Futura Extra Bold
Futura Extra Bold Oblique

FON 0282 **Utopia® Regular**
Utopia Italic
Utopia Semibold
Utopia Semibold Italic
Utopia Bold
Utopia Bold Italic
Utopia Black **NEW!**

Suggested Retail: \$275 **\$179**

FON 0280 **Adobe Garamond® Regular**
Adobe Garamond Italic
Adobe Garamond Semibold
Adobe Garamond Semibold Italic
Adobe Garamond Bold
Adobe Garamond Bold Italic **NEW!**

Suggested Retail: \$275 **\$182**

FON 0238 **ITC Berkeley Oldstyle® Book**
ITC Berkeley Oldstyle Book Italic
ITC Berkeley Oldstyle Medium
ITC Berkeley Oldstyle Medium Italic
ITC Berkeley Oldstyle Bold
ITC Berkeley Oldstyle Bold Italic
ITC Berkeley Oldstyle Black
ITC Berkeley Oldstyle Black Italic **NEW!**

FON 0160 **Futura Condensed Light**
Futura Condensed Light Oblique
Futura Condensed
Futura Condensed Oblique
Futura Condensed Bold
Futura Condensed Bold Oblique
Futura Condensed Extra Bold
Futura Condensed Extra Bold Oblique

FON 0117 **Helvetica Condensed Light**
Helvetica Condensed Light Oblique
Helvetica Condensed
Helvetica Condensed Oblique
Helvetica Condensed Bold
Helvetica Condensed Bold Oblique
Helvetica Condensed Black
Helvetica Condensed Black Oblique

FON 0237 **Hiroshige® Book**
Hiroshige Book Italic
Hiroshige Medium
Hiroshige Medium Italic
Hiroshige Bold
Hiroshige Bold Italic **NEW!**
Hiroshige Black
Hiroshige Black Italic

FON 0239 **New Aster®**
New Aster Italic
New Aster Semi Bold
New Aster Semi Bold Italic
New Aster Bold
New Aster Bold Italic **NEW!**
New Aster Black
New Aster Black Italic

FON 0150 **Univers Light 45**
Univers Light Oblique
Univers 55
Univers Oblique
Univers Bold 65
Univers Bold Oblique
Univers Black 75
Univers Black Oblique

Suggested Retail: \$370 **\$239**

FON 0180 **ITC Clearface® Regular**
ITC Clearface Regular Italic
ITC Clearface Bold
ITC Clearface Bold Italic
ITC Clearface Heavy
ITC Clearface Heavy Italic
ITC Clearface Black
ITC Clearface Black Italic

Suggested Retail: \$370 **\$245**



Adobe Type Manager

ATM works with the more than 600 typefaces from the Adobe® Type Library to ensure that your type looks sharp on-screen and prints sharp from your Apple ImageWriter®, HP DeskWriter®, and most other QuickDraw™ devices. The MacWAREHOUSE low price is just \$55! Order No. FON 0264



Adobe Illustrator 3.0

The page creation and layout solution! New text-handling and graphics tools allow direct, on-screen entering and manipulation of text. Also automatic creation, manipulation and customization of charts. Includes FREE copy of Adobe Type Manager. Our low price is just \$357! Order No. DTP 0054

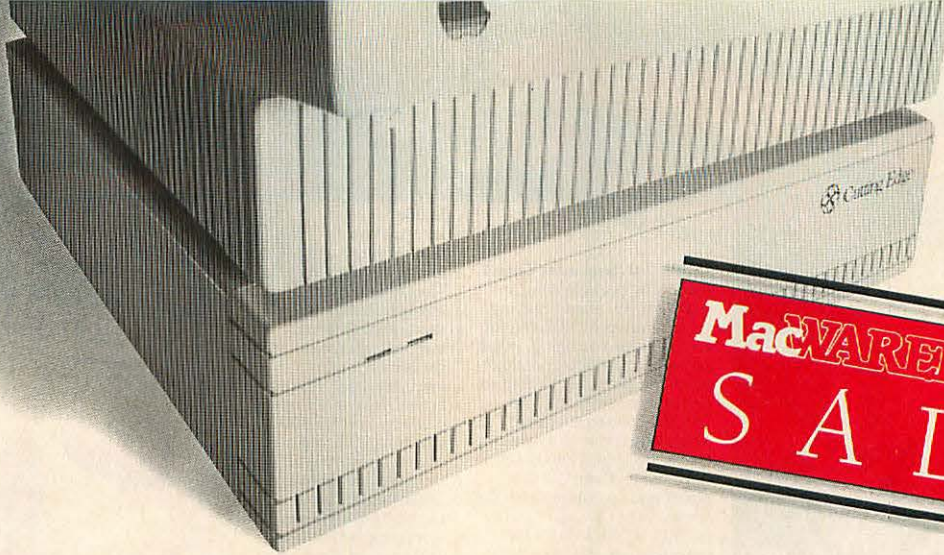
MacWAREHOUSE™

1-800-255-6227

Call 24 hours a day, 7 days a week

ADOBE

MWJ0A



If You Can Find A Better Deal In Hard Drives . . .

Between now and August 31st, MacWarehouse is offering savings on every hard drive we sell. So, if you're thinking of buying a new hard drive, your timing couldn't be better. Check out our sale prices and your savings, compared to our December 1989 prices, in the chart.

We offer drives by leading manufacturers like Cutting Edge, C.M.S., Quantum, Power User, PLI Infinity Turbo and others — all at unheard of low prices.

Let our helpful sales staff take the hassle out of buying a drive. They'll tell you which drive

MONEY BACK GUARANTEE

They'll tell you which drives come with the MacWarehouse 30-day money back guarantee. Try one at home. And if, for any reason, you're not 100% satisfied,

LIMITED TIME OFFER

MacWarehouse sale prices, based on capacity, are shown in the chart. Also shown are the savings from pre-holiday prices. (This is a limited time offer, valid

through August 31, 1990.) Overnight delivery is just \$3, anywhere in the Continental United States.

So call us now and tomorrow morning you'll be up and running with the best hard drive deal in the business!

	20 + MB		30 + MB		40 + MB		60 + MB		80 + MB		***40 + Removable	
	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE
Cutting Edge	309	\$120	379	\$120	435	\$114	469	\$160	529	\$210	699	\$200
CMS, MacStack	429	\$100	499	\$46	589	\$36	649	\$50	769	\$30	839	\$36
Power User	309	NEW	359	NEW	399	NEW	459	NEW	499	NEW	659	NEW
PLI, Infinity Turbo	-	-	569	\$20	619	**\$26	-	-	-	-	999	\$120
*Quantum Internal	-	-	-	-	399	\$126	-	-	649	\$220	-	-

Savings are calculated from MacWarehouse December 1989 published prices. *Quantum drives are for internal installation and require a 3.5" Internal Drive Kit for \$75. **PLI is a 50meg turbo drive. ***40 + meg Removable Cartridge Drives come with 1 cartridge. Additional cartridges available.

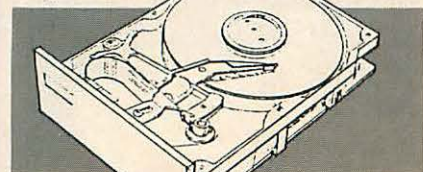
just return it to us within thirty days and we'll refund your money.

Then there's the MacWarehouse Loaner Drive Program. Buy from MacWarehouse and if you ever have a problem, you won't be without a drive for more than a few hours.

READY TO USE

A hard drive from MacWarehouse couldn't be easier to use. We'll tell you which ones come pre-formatted — ready to use right out of the box. You just plug in, turn on your Mac and go!

If you do need any help, the MacWarehouse Technical Support staff is standing by our toll-free lines to assist you.



mechanism each manufacturer uses. They'll also tell you about access speed, reliability, software and the manufacturer's warranty.

MacWAREHOUSE™
1-800-255-6227

Call toll-free
Twenty-four hours a day,
seven days a week.
Inquiries 1-908-367-0440
Fax 1-908-905-9279
© Micro Warehouse Inc.

MacWarehouse 30-Day Money Back Guarantee

Many of our drives come with the MacWarehouse 30-Day Money Back Guarantee. If, for any reason, you're not completely satisfied, call us within thirty days of receipt for a return authorization number and full refund of the purchase price.

OVERNIGHT DELIVERY
ONLY \$3.00
(See details below)

GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



MORE 3.0 (Symantec Corp.)

Producing backbreaking reports got you ahead, staying there requires MORE! MORE 3.0 combines outlining, word processing, desktop presentations and financial charting so concepts zoom from your "doodle" pad to the board room in no time. A single step transforms ideas into bullet or tree charts. Over 100 templates and layouts simplify the formatting of all your documents. MORE's Chart Tutor even provides step-by-step instructions on preparing everything from overhead transparencies to 35 mm slides. (business) \$265.

Inside Information (Microlytics)

Consider your Thesaurus extinct! Inside Information is the next evolutionary step in language organization for the electronic age. This essential desk accessory contains over 65,000 words logically organized in a hierarchical dictionary containing seven general word classes broken down into respective sub classes, categories and subcategories. Access information by scrolling through, clicking and expanding on topics organized in four logical formats. Perfect for research writing or boning up on topical "Buzz" words for presentations. (desk accessories) \$69.



ACCESSORIES

Abcom (full line available)	
Dust Covers starting at 10.	
American Power Conversion	
110 SE UPS 219.	
370 ci UPS 349.	
Basic Needs, Inc.	
HardCovers Keyboard Covers 15.	
HardCovers ImageWriter 17.	
Keyboard Flip 6.	
Dust Covers - Grey Nylon Ripstop	
Mac Plus and keyboard 11.	
Mac SE & extd. or reg. keyboard 11.	
Mac II and extd. keyboard 12.	
Mac IIcx/ci Monitor Stand 40.	
Universal Laser Printer Stand 28.	
Utility Pac 11.	
Computer Giftware	
Mouse Pads starting at 12.	
Curtis	
Command Center 89.	
Computer Tool Kit (52 pc.) 49.	
Ergotron	
MacTilt-SE 68.	
MacTilt II-RGB 75.	
I/O Designs	
Imageware II Carrying Case 49.	
Macinware IIcx Carrying Case 85.	
Macinware Mac II Carrying Case 99.	
Macinware Plus Carrying Case 64.	
Macinware SE Carrying Case 75.	
Monitorware Apple RGB Case 79.	
The Ultimate SE Carrying Case 79.	
The Ultimate Neon Carrying Case 89.	
Kensington	
Anti-Glare Filter 33.	
Apple Security System 34.	
LaserWriter II Security System 32.	
MasterPiece Mac II 105.	
PowerBacker 360 UPS Line 269.	
PowerBacker 800 UPS Line 749.	

SE Radiation Shield 54.	
System Saver Mac 63.	
Mobius Products	
Fanny Mac QT 55.	
SE Silencer 39.	
Targus, Ltd.	
Deluxe Plus/SE-XKB Case (black) 69.	
ImageWriter II Case (black) 45.	
Mac Plus/SE Case (black) 55.	
IIcx/IIci Case 75.	
Premier Leather Case 175.	



ACCOUNTING & PERSONAL FINANCES

Aatrix	
Checkwriter II 2.8 37.	
Payroll 3.5 109.	
Payroll PLUS or TimeMinder 175.	
Absolute Solutions	
Computerized Classic Accounting .. 225.	

Macintosh SE/Plus w/Extended Keyboard Carrying Case (Targus)

Pamper your Mac with a Targus case made of Zilicone treated nylon to give you waterproof durability and an impact absorbing high-density foam layer with a soft protective lining for complete protection. Cushioned shoulder pad and handles provide extra comfort and convenience. Plus there's room for everything from your Mac, a hard disk drive, and the extended keyboard to pockets for your mouse, floppies, cables, and pens. (accessories) \$69. Full line available.

Intuit	
Quicken 1.5 35.	
Layered, Inc.	
at Once! 285.	
MECA	
Managing Your Money 122.	
Monogram	
Business Sense 269.	

Mouse Pads (Computer Giftware)

For sophistication during hours - and excitement after! Executive Pads put the elegance of marble on your desk. These pads look like the real thing but only your mouse knows for sure! Choose from White Italian Marble, Green Marble, Granite, and even Kentucky Burlwood. \$12. After the grind why not invite a Bikini-clad California Girl or Volley Ball Hunk over to your

Bachelor or Bachelorette Pad? \$13. The truly daring may even opt for an exciting adventure with **Indiana Jones. \$15.** (accessories)

Nolo Press	
For The Record 29.	
WillMaker 32.	
Reality Technologies	
Wealthbuilder 165.	
Survivor	
MacMoney 3.5 59.	

BLANK MEDIA

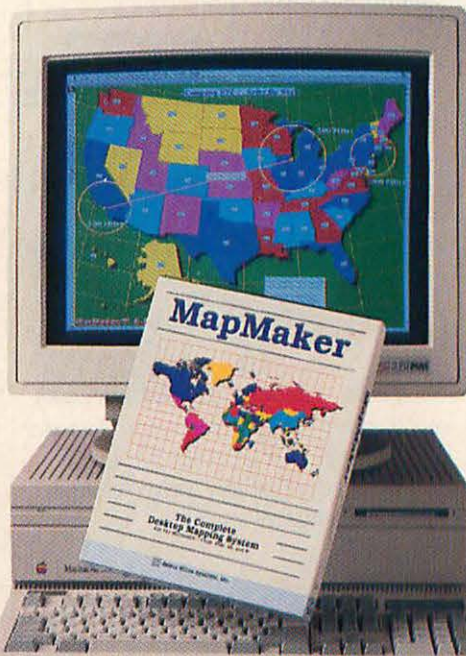
B.A.S.F. made in U.S.A.	
DS/DD (box of 10) 14.	
DS/High Density (1.44 Meg) 24.	
Sony	
DS/DD (box of 10) 13.	
DS/HD (1.44 mb) 24.	

BUSINESS & PRESENTATION

A Lasting Impression	
ResumExpert (word vers.) 39.	
Cover Letters or Students ea. 39.	
Managers or Sales & Marketing .. ea. 39.	
Healthcare or Finance & Banking .. ea. 39.	
Education or Arts & Leisure ea. 39.	
Comp. Sciences & Engineering 39.	
AEC Management Systems	
FastTrack Schedule 1.5 139.	
Aldus	
Persuasion 2.0 329.	
Claris	
MacProject II 365.	
SmartForm Designer w/Assistant 289.	

ATLAS*MapMaker Version 4.5 (Strategic Mapping, Inc.)

Put your business on the map! ATLAS*Mapmaker 4.5 quickly displays hidden relationships in geographic data with striking color graphics. Includes everything you need to map the U.S. & the world by a wide variety of criteria. Import your own data or use the U.S. Census statistics included. Use ATLAS*MapMaker to read ZIP-coded "name and address" files, then aggregate their data into essential information for target marketing and more. (graphics) \$295.

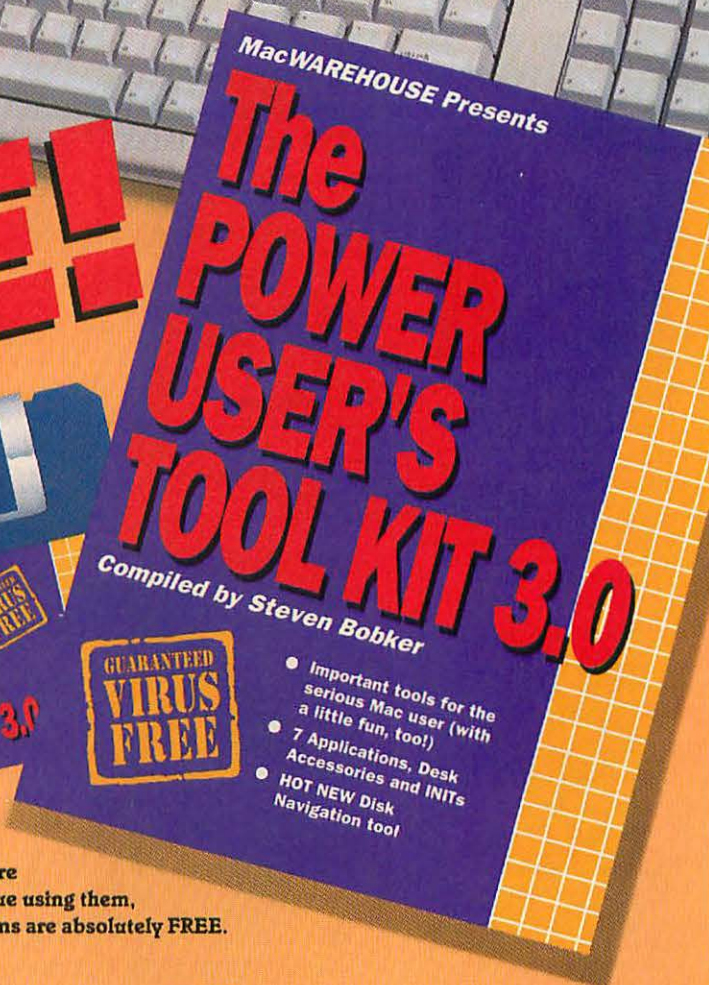


FREE!

The new 3.0 edition of the popular Power User's Tool Kit includes **BOOMERANG 2.0**, an ingenious utility, which makes it much easier to use the SF Dialog (the dialog box that appears when you choose Open or Save from the file menu).

You'll also find the latest version of **DISINFECTANT** (anti-viral freeware) and **REMEMBER?**, a handy reminder of the day's events when you start up your Mac.

The **POWER USER'S TOOL KIT 3.0** is **FREE** from MacWAREHOUSE when you order from us. If you want the disk, you pay only \$1.50 for shipping and handling. The programs are shareware, so you can try them free of charge. If you wish to continue using them, some authors ask that you pay a fee (\$10-\$35). Many of the programs are absolutely **FREE**. All of the details are explained on the disk, which is yours to keep.

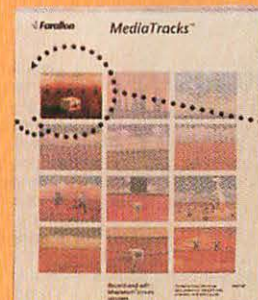


LAST CHANCE TO WIN A TRIP TO LONDON!

There's still time to enter our latest contest and win an all-expenses-paid trip to the MacUser U.K. Show in London, November 7-10, 1990. Your name is automatically entered in to the drawing when you order from MacWAREHOUSE. Or, just fill out and mail the entry coupon below.

Freedom of Press 2.4 (Custom Applications, Inc.)

New, updated Freedom of Press allows Printing of PostScript language files on any of over 50 different printers and film recorders. In combination with your favorite desktop publishing, graphics, drawing, painting and word processing software, Freedom of Press allows you to print PostScript language files, including support for 24 bit continuous tone color images. Complete with 35 scalable and rotatable outline fonts and drivers for all supported printers. Requires Macintosh SE30, II, IIx, IIx or IIfx. (utilities) \$255.

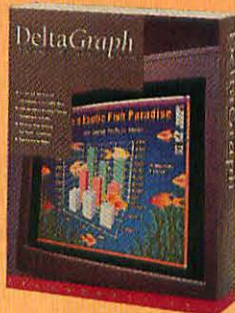


MediaTracks (Farallon)

MediaTracks lets you record whatever takes place on your screen so your audience can watch "tapes" of that activity just as it appeared. MediaTracks comes with a full set of tools for editing and annotating tapes. Use it in conjunction with MacRecorder to add clarifying narration. No more need to waste time repeating instructions, just tape a common procedure once, and let people watch it at their convenience. (communications) \$189.

DeltaGraph 1.5 (DeltaPoint)

Chart a course for success with new DeltaGraph 1.5! This powerful 2 and 3-D full color charting program delivers everything you'll need to create professional looking charts for business and scientific presentations. Features 25 Chart types, overlays, Superscripts/Subscripts, CricketGraph file import and more. Use the Data Notebook to import spreadsheet data and DeltaGraph will create the chart you want. Then import EPS or PICT files or use DeltaGraph's extensive drawing tools for embellishment. (business) \$97.



I'm Kerry, call me at:

MacWAREHOUSE
1-800-255-6227

(1-800-ALL-MACS)

Inquires: 908-367-0440
FAX: 908-905-9279

Call anytime - day or night
24 hours a day, seven days
a week.

*Midnight Express service available
weekdays.



OFFICIAL ENTRY COUPON

MWJØ

Concorde to London Contest

1690 Oak Street, P.O. Box 1579, Lakewood, NJ 08701

When you order by phone or mail, you are automatically entered in the drawing. You can also mail this coupon or call our contest entry line. 1-800-367-0787. (In CT., call 1-203-852-8968)

Name _____

Address _____

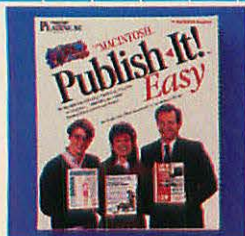
Apt. _____

City _____

State _____

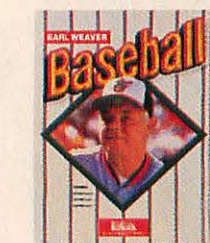
Zip _____

FROM MacWAREHOUSE™



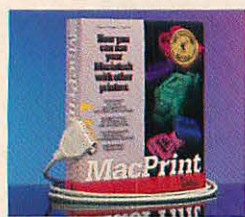
Publish-It! Easy

Combines the sophistication of Publish-It! with 10 Desktop Publishing firsts and an innovative, new, easier-than-ever user interface. Includes fully integrated word processor, 112,000 word spell checker, 240,000 word thesaurus, advanced page layout, drawing and painting tools, and more! (desktop publishing) \$113.



Earl Weaver Baseball

Exciting major-league action, TV style special effects, and the strategies of Earl Weaver make for realistic, comprehensive sports simulation. Batter/Pitcher confrontation screen centers you in the action. Receive a FREE 1989 Baseball stats disk with purchase. Offer good while supplies last. (entertainment) \$32.



MacPrint

Easy-to-use software utility that lets you use almost any Mac application on virtually any printer including HP LaserJet II and IID. MacPrint displays all your printer's fonts for true WYSIWYG performance. Prints text and graphics at your printer's maximum resolution. (utilities) \$95.

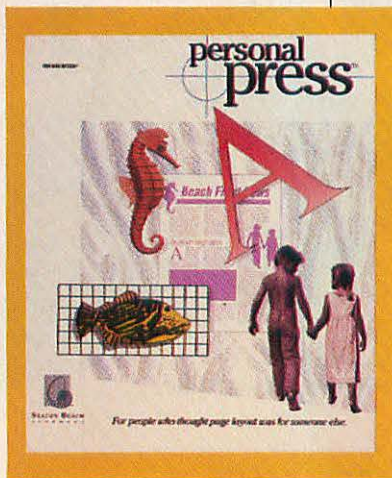


Hard Covers

Hardtop printer and keyboard covers made from high impact ABS plastic fit right on your keyboard or printer to provide solid protection against dust and spills. Guards against damage while in transit. (accessories) Starting at \$15.

DESK ACCESSORIES

Casady & Greene	
QuickDEX	31.
Dubi-Click	
Calculator Construction Set v. 2.0	45.
JAM Software	
Smart Alarms & Appt. Diary	64.
Smart Alarms (1 - 4 users)	125.
Smart Alarms (5 - 8 users)	189.
Smart Alarms (9 - 15 users)	249.
Smart Alarms (16-25 users)	375.
Microlytics	
Inside Information	69.
Preferred Publishers	
DAtabase 1.5	68.
Vantage 1.5	52.
Solutions	
SmartScrap & The Clipper 2.0	45.
Vision Software	
Form Layout	35.



Personal Press

(Silicon Beach)

Personal Press creates professional layouts for you. Forget the long, steep learning curve, because Personal Press has AutoCreate to assemble stories and graphics into templates. It includes a full-featured word processor with spelling checker and thesaurus, controls for scanned images, spot color separations, posted notes, link navigator, extensive page previewing, and on-line help. (desktop publishing) \$199.

DESKTOP PUBLISHING

Aldus	
PageMaker 4.0	499.
PrePrint	345.
Data Translation	
PhotoMac	609.
Letraset	
ColorStudio	1,579.
FontStudio	459.
ImageStudio or Ready, Set, Go!	275.
OLDUVA!	
Read-It! 2.1 (OCR)	278.
Read-It! Personal 2.0	139.
Read-It! TS (ThunderScan)	79.
Quark	
QuarkStyle	169.
XPress 2.12	469.
XPress 3.0	519.
Silicon Beach	
Personal Press	199.
Spinnaker	
PLUS 2.0	115.
Springboard Publisher II	109.
TimeWorks	
Publish-It! Easy	113.

DISK DRIVES/BOARDS

CMS	
MacStack 20 Meg	429.
MacStack 30 Meg	499.
MacStack 45 Meg	589.
MacStack 60 Meg	649.
MacStack 80 Meg	769.
MacStack 44 Meg Removable	839.
Cutting Edge	
800K External Floppy Drive	149.
SyQuest Removable 45 Meg	699.
Under the Mac 20 Meg	309.
Under the Mac 30+ Meg	379.
Under the Mac 45+ Meg	435.
Under the Mac 60+ Meg	469.
Under the Mac 80+ Meg	529.
Dayna Communications	
Dayna File Single 360K (5 1/4")	525.

FastLabel 2.0

(Vertical Solutions)

Stick it to the chore of simple label printing in three easy steps! Import addresses, lists and graphics, then use FastLabel's preformatted templates (or create your own) to produce everything from disk, V.C.R. and cassette labels to name badges, signs and more. (business) \$89

FastEnvelope - This handy DA lets you import lists and graphics to print eye-catching envelopes, then adds postal bar codes saving you time and money on bulk mailings. (business) \$50



RasterOps

RasterOps Colorboard 264 699.

EDUCATIONAL/PERSONAL

Beacon Technology

GEMS of the Word 25.

BrightStar

Alphabet Blocks 30.

Talking Tiles 26.

Davidson

Math Blaster or Speed Reader 26.

Fair Tide Technologies

Navigate! mono. 199.

Learning Company

Math Rabbit or Reader Rabbit ea. 30.

Nordic Software (full line available)

MacKids Preschool Pack 35.

Penton Overseas

VocabuLearn French, Spanish, German, Italian, Russian, or Hebrew ea. 35.

VocabuLearn Japanese 35.

Voice & Video Instruction Videos

HyperCard or Pagemaker 3.0 ea. 35.

Word 4.0 Video Tape 35.

ENTERTAINMENT

Artworx

Bridge 6.0 24.

Daily Double Horse Racing 19.

Broderbund

Ancient Art of War At Sea 27.

Shufflepuck Cafe 24.

Where in Time is Carmen Sandiego? Call

The Ultimate Neon SE Carrying Case

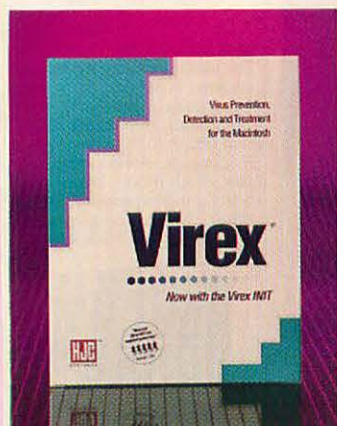
(I/O Design)

Here's the latest in fashionable outerwear for the active Macintosh. It's the NEW "Neon Ultimate" SE in fluorescent green, hot pink and brilliant yellow neon accents! Pamper and protect your Plus or SE with its high density foam padding & durable DuPont Cordura nylon exterior. Secure all your peripherals in its roomy padded inner compartments & two exterior pockets. **FREE** matching disk wallet with every purchase while supplies last. (accessories) 89.



MORE FOR YOUR MONEY...

Deltapoint	
Delta Graph 1.5	97.
Imagine That!	
Extend	339.
Informix	
WingZ 1.1	245.
Kaetron	
Top Down 2.0	199.
Mainstay	
MacSCHEDULE	127.
Microsoft	
Excel 2.2 or PowerPoint 2.1	ea.245.
The Microsoft Office	525.
The Microsoft Office-CD	669.
Works 2.0	179.
Portfolio Systems	
Dynodex-w binder & paper	57.
Paper	14.
Power Up	
Address Book Plus	53.
Address Book Plus w/Binder	99.
Calendar Creator	38.
FastForms!	89.
Letter Writer Plus	53.
Preferred Publishers	
Direct Mail	54.
Satori	
Bulk Mailer	75.
Shana Enterprises	
Informed Designer	167.



Virex 2.7 (HJC/Microcom)
Immunize your Mac against deadly computer viruses! Just give the command and Virex with The Virex INIT is on duty monitoring your Mac to prevent infection from all known Mac viruses. Use Virex's Record/Scan feature to identify previously unknown viruses. Once diagnosed, order Virex to operate and repair files like a skilled surgeon. Rapid upgrades stop new virus strains in their tracks. Registered users receive update notices and have access to publisher's Toll-free Virex Help Hotline. (virus protection) **\$56.**

Softstream International	
Endeavour Planner	95.
Symantec	
More 3.0	265.
Symmetry	
KeyPlan	275.
SYNEX	
MacEnvelope 5.0	57.
MacEnvelope Plus	159.
MacPhonebook	51.
Vertical Solutions	
FastLabel 2.0	89.
FastEnvelope	50.
Zedcor	
DeskWorks	229.

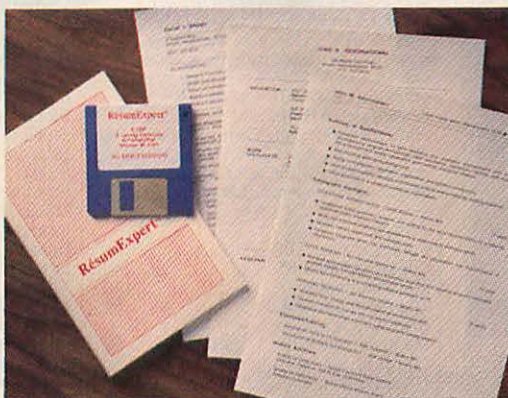
CAD/CAE

Clarix	
ClarixCAD	579.
Graphsoft	
Blueprint	219.
MiniCad+3.0	519.
Innovative Data Design	
MacDraft 2.0	195.
Strata	
StrataVision 3D	375.

ResumExpert (A

Lasting Impression)

Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 Software Programs of



1989. See line listings for all 10 editions. (business) **\$39. each**

COMMUNICATIONS & NETWORKING

CE Software	
In/Out (1 to 5 Users)	128.
QuickMail 2.2 (1-10 Users)	315.
CompuServe	
CompuServe Navigator 3.0	49.
CompuServe Subscription Kit	23.
DataVIZ	
MacLink Plus w/Cable	119.
MacLink Plus/Translators	99.
Dove	
FastNet SCSI	749.
FastNet III SE or SE/30	ea. 375.
Dow Jones	
News/Retrieval Membership	24.
Farallon	
MediaTracks	189.
PhoneNET Connector 10 Pack	249.
PhoneNET Repeater	329.
PhoneNET Star Controller	825.
Timbuktu 3.1	95.
Timbuktu Remote	123.
TrafficWatch	125.
FreeSoft	
White Knight 11.0	85.
Infosphere	
Liaison	175.
InSignia Solutions	
Soft PC (Mac II)	245.
Microcom Software	
Carbon Copy Mac	119.
Prodigy	
Mac Starter Kit	27.

Prometheus	
MacKNOWLEDGE	85.
Shiva	
DOS Dial-In or CONNECT	ea. 69.
Software Ventures	
Microphone II v.3.0	215.
Solutions	
FaxGate Plus	239.
MailMaker (5-Pack)	117.
TOPS	
InBox Plus 3.0	1299.
NetPrint or Repeater	119.
FlashCard	155.
TOPS 3.0 Network Bundle	187.
TOPS DOS Network Bundle	165.
Traveling Software	
Lap-Link III Connectivity Pac	119.
Lap-Link III Network Pac	185.

DATABASE SOFTWARE

Acius	
4th Dimension 2.0	465.
FileForce	249.
AEC Management Systems	
AEC Information Manager	409.
Blyth	
Omnis 5	429.
Clarix	
FileMaker Pro	219.
Fox Software	
FoxBASE+Mac	292.
Odesta	
Double Helix III	389.
GeoQuery	229.
ProVUE	
Panorama	249.

- VISA and MASTERCARD accepted. No surcharge.
 - Your credit card will not be charged until your order is shipped.
 - If we must ship a partial order, we pay the freight on the remaining portion.
 - All U.S. shipments are insured at no extra charge.
 - C.O.D. orders accepted (add \$6.00 including shipping) — \$1,000 maximum. Cash, money order, or cashier's check.
 - Corporate purchase order accepted subject to credit approval.
 - All products are covered by a 120 day limited warranty.
 - Sales Tax: CT residents add 8%, NJ and Ohio residents add appropriate tax.
- SHIPPING**
- All orders add \$3.00 per order. We ship Airborne Express overnight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)
 - Orders placed by 12:00 Midnight (EST) (weekdays) for "in stock" items ship same day (barring system failure, etc.) for overnight delivery.
 - C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is \$6 including shipping.
 - Alaska, Hawaii, outside continental U.S., APO/FPO call 908-367-0440 for information.

*Defective software replaced immediately. Hardware replaced or repaired at our discretion. **We regret that we cannot be responsible for typographical errors.

I'm Kerry, call me at:

1-800-255-6227
(1-800-ALL-MACS) Now works in Canada.

Inquiries: 908-367-0440 Fax # 908-905-9279 (NOTE NEW NJ AREA CODE)

MacWAREHOUSE™

1690 Oak Street, P.O. Box 1579,
Lakewood, NJ 08701

ORDER TOLL-FREE
24 HOURS A DAY



MarcoPolo

Assemble documents in a special-purpose database where information is compressed and indexed for rapid search and retrieval. Once stored, find and distribute documents based on content, author, title, commentary or archival date. (utilities) **Single User \$155. 5 Pack \$519.**



Bridge 6.0

Comprehensive "contract" or "duplicate" bridge-playing program which allows you and your computer partner to bid against two computer opponents and play out the hand. Ideal way to improve your skills, and get into a game without having to round up three additional players. (entertainment) **\$24.**



Dow Jones News/Retrieval

Membership package comes with E-Z Online communications software, provides the new user with **5 hours of free online time.** Connects with more than 50 databases, up-to-the-minute news and financial data, plus extensive reference library. (communications) **\$24.**



New! The ProModem 2400Minifax

The Minifax is a 9600 bps, send-only fax and a 2400bps data modem. Send Mac documents directly to any Group III fax machine in the world, or use it as a 2400 bps data modem for connecting to online services, sending Email or transferring files. Includes new fax software, Maxfax, MacKNOWLEDGE, and a Mac cable. (modems/fax) **\$209.**

GUARANTEE

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



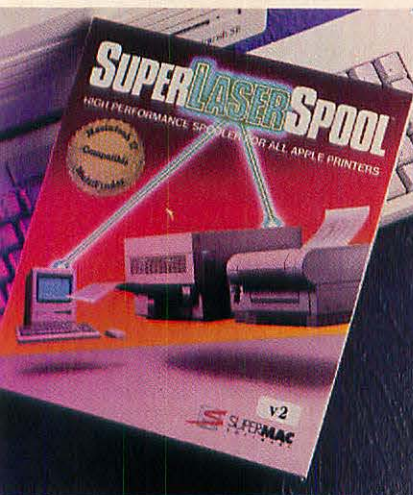
Bullseye

Ferrari Grand Prix or P51	ea 32.
Fokker Tri-plane	23.
Centron Software, Inc.	
BlackJack or CrapsMaster	ea 27.
BlackJack Strategy Tester	65.
CasinoMaster (5 pack)	49.
CasinoMaster Deluxe Mac II version ..	55.
MicroLeague Sports	
MicroLeague Baseball II	38.
Softstream	
22nd St. Whist Tutor or MacRummy ..	32.
Spectrum Holobyte	
Tetris	22.
Welltris	19.
The Software Toolworks	
ChessMaster or Life & Death	ea 32.
Cribbage & Gin King	39.
The Hunt for Red October	20.
Three Sixty	
Sands of Fire	32.
Toyogo's Nemesis	
Go Master	49.
Joseki Genius	30.
Tactical Wizard	37.
Deluxe	99.
Visionary Software	
Synchronicity	39.
XOR	
Lunar Rescue or MacGolf 2.0	34.
MacGolf Classic	52.
Road Racer	39.
NFL Challenge	55.
TaskMaker	29.

Fonts

Adobe (Full line available)

Adobe Type Manager 2.0	55.
Adobe Type Reunion	39.
Plus Pack	109.
TypeAlign	59.
Type Set 1 or Type Set 2	ea 58.



MegaScreen Rival (MegaGraphics)

MegaScreen Rival — Macworld Magazine's "First Choice" in black-and-white big screens. Combined with our excellent price, we rate this WYSIWYG two-page system your BEST BUY. 1024 x 826 resolution; flicker-free 75 Hz refresh. Interface cards and cables included. Compatible with Mac Plus, Mac SE, Mac SE/30, and all Mac II models. See line listing for additional MegaScreen systems. (hardware) \$1,275.

Altsys

Fontastic Plus 2.02	51.
Fontographer 3.05	249.
Metamorphosis	149.
The Art Importer 2.0	89.
Dubi-Click	
Menu Fonts 3.0	28.
Letraset	
LetraStudio	275.
LetraFonts (various)	ea 69.

WIZ (CalComp)

Everything else is just a mouse! It's a full featured mouse system, compatible with all mouse driven packages. Not only do you have mouse features, but the ability to draw and trace with accuracy, because WIZ has 1000 dpi, absolute positioning and comes with a cross hair pointer on the WIZ mouse. Define macros, minimize wrist movement with adjustable pad scaling. Optional software templates for over 19 software packages, lets you by-pass pull-down menus, making command selection a one click process. Requires Mac II/SE. 5 year MFG. warranty. (input/output) **WIZ tablet \$159, Optional templates \$33 each. Optional 2 button pen \$57.**



Tactic Software

ArtFonts	55.
----------------	-----

GRAPHICS & DESIGN

3G Graphics

Graphics & Symbols 1	50.
Business 1 or Accents & Brdrs 1 ..	ea 65.

Adobe

Illustrator 3.0	357.
Photoshop	499.
Smart Art I, II, III, or IV	ea 84.
Streamline	225.

Aldus

Freehand 2.0	329.
--------------------	------

Aperture Technology

Aperture Visual Information Mgr.	729.
---------------------------------------	------

Bright Star Technology

HyperAnimator 1.5.1	98.
---------------------------	-----

interFACE

interFACE	249.
-----------------	------

Broderbund

TypeStyler	119.
------------------	------

Claris

MacDraw II	289.
------------------	------

MacPaint 2.0

MacPaint 2.0	93.
--------------------	-----

Deneba

Canvas 2.1	189.
------------------	------

Ultra Paint

Ultra Paint	125.
-------------------	------

SuperLaserSpool 2.02 (SuperMac)

Now spools to HP DeskWriter printer. One of the best selling print spoolers for the Mac is here! You get your Mac back seconds after sending a document to the printer. Prints in the background. Handles large and complex graphics, spreadsheet or database documents. Special desk accessory allows you to see and manipulate the print queue; delete documents, re-order documents to other printers. Also works with all Apple printers and postscript devices using the Apple printer drivers. (utilities) \$87.

Digital Vision

Computer Eyes B&W	199.
-------------------------	------

Computer Eyes Pro Color	349.
-------------------------------	------

Dream Maker

Cliptures, Business Images	69.
----------------------------------	-----

MacGallery	27.
------------------	-----

Electronic Arts

Studio/1	96.
----------------	-----

Studio/8	295.
----------------	------

Studio/32	Call.
-----------------	-------

Farallon

MediaTracks	189.
-------------------	------

Innovative Data Design

Dreams	319.
--------------	------

Letraset

Shapes	Call.
--------------	-------

MacroMind

MacroMind Director	439.
--------------------------	------

Metro ImageBase (Full Line Available)

Art Deco or ReportMaker	ea 85.
-------------------------------	--------

Newsletter Maker or Business	ea 85.
------------------------------------	--------



Mac286 v3.0/Co-Processor

Free Nubus slots while running MS-DOS applications from your Mac II. The Mac286 card slips into a single Nubus slot and provides up to 4MB of RAM to run MS-DOS software in a separate widow. Provides IBM AT productivity, compatibility with MultiFinder and true multitasking. (drives/boards) \$1079.



Bulk Mailer 3.25

The ideal mail list management system. Contains duplication elimination, various sorting capabilities and search codes. Can utilize all fonts and styles, mail merge, envelope printing, plus much more. Works great with Canadian postal codes and other international mailing requirements. (business) \$75.



MicroPhone II 3.0

MicroPhone II scripting language makes using electronic mail services an automatic operation. Other types of file transfers are equally effortless. MicroPhone II 3.0 now supports the hot new ZMODEM, transfer protocol (in addition to XMODEM, YMODEM, KERMIT, and MacTerminal 1.1) and can operate modems at any speed from 50 to 57,600 baud. (communications) \$215.

Micro Frontier

Enhance	235.
---------------	------

Multi Ad Services

Multi-Ad Creator	865.
------------------------	------

ThunderScan Plus ThunderWorks (Thunderware)

Turn your ImageWriter into a gray scale scanner. Import images into desktop publishing, painting, drawing or OCR programs. Scans in 64 gray levels, edits grays, and comes with 13 special effect filters. \$199.

Lightning Scan 400 with ThunderWorks

Most powerful hand-held scanner for the Mac. Scans flat surfaces instantly. Includes ThunderWorks image editing software for full-page scanning and DA for scanning in any program. Saves in 37 gray levels. Includes SnapGuide and RAM buffer. (input/output) \$385.





Metamorphosis (Altsys)
Metamorphosis converts PostScript fonts into a variety of formats, now including Type 1 (ATM-compatible!). Edit, modify, or regenerate your PostScript fonts. Manipulate type outlines in Aldus Free-Hand or Adobe Illustrator to create special font effects.

Metamorphosis converts your Type 3 fonts into Type 1 format for more accurate viewing in screen when using Adobe type Manager and more precise printing on any PostScript printer. **\$149.**

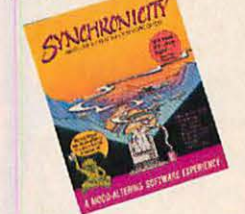
The Art Importer
Sold! When it comes to collecting imported art, serious Mac users give their high bid to The Art Importer. Use the Art Importer to create high resolution PostScript fonts from Mac artwork. The fonts are compatible with most Mac applications. (fonts) **\$89.**



QuarkXPress 3.0
New measurement and page palettes provide interactive on-screen access. A library stores frequently used items, and a pasteboard provides a work area next to each page. Rotate text and graphics in 0.001 degree increments up to 360 degrees. (desktop publishing) **\$519.**



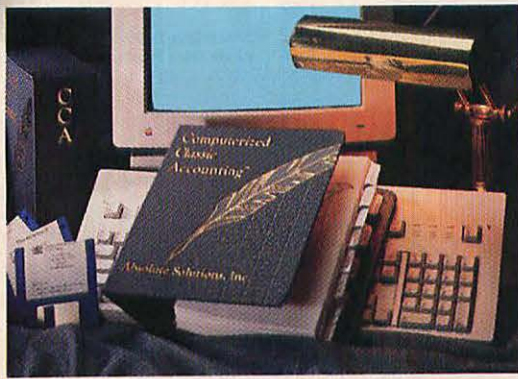
Fontographer 3.1
Reads and writes Type 1 PostScript fonts! Create & edit downloadable PostScript fonts containing standard alphanumeric and foreign characters, pictograms, icons, and logos. The auto-trace function to saves time when working with scanned characters and images. (fonts) **\$249.**



Synchronicity
This Mac realization of the ancient Chinese book of changes (I Ching) provides needed moments of serenity on busy days. Animation and sound effects send users into peaceful moods while requesting key words to reference several thoughtful passages. (education) **\$39.**

Computerized Classic Accounting (Absolute Solutions)

Mimicking the paper journals and ledgers that bookkeepers and accountants are accustomed to, Computerized Classic Accounting provides a remarkable level of accounting, record keeping and analysis, in a simple, flexible product that can be easily customized. CCA is the only true, fully integrated spreadsheet accounting product. CCA was nominated



by Macuser for an Eddy and has earned a 4-1/2 mouse rating. (accounting) **\$225.**

Paracomp	
DrawTools	64.
Swivel 3D 1.1	295.
Silicon Beach	
Digital Darkroom	248.
Super 3D 2.0	315.
SuperPaint 2.0	125.
SoftStream	
Relational Objex	150.
Somak	
LaserArt CD-ROM #1 or #2	ea. 59.
Sharpen Up	59.
Strata	
StrataVISION 3d	375.
Strategic Mapping, Inc. (Select Micro)	
Map Maker 4.5	295.
Studiotechnics	
Colorset 1.5	229.
SuperMac	
PixelPaint 2.0	225.
PixelPaint Professional	389.
Tactic Software	
Art Clips Vol. 1 or Vol. 2	Call.
T/Maker	
Click Art Business Images	32.
EPS Illustrations	85.
Business Cartoons	33.
Zedcor	
DeskPaint & DeskDraw	115.

HARDWARE & PERIPHERALS

Aapps	
DigiVideo	399.
MicroTV	265.

General Computing Company	
WriteMove Ink Jet Printer	575.
MegaGraphics	
Rival 2001 System for Mac II	1275.
Rival 3001 System for Mac SE/30	1275.
Rival SE System for Mac SE	1275.
Rival Plus System for Mac Plus	1310.
19" Color 2008 Hi-Res/Mac II	4460.
16" Color 2008 Hi-Res/Mac II	3525.
Grayscale 2008/Mac II	2210.
Grayscale 3008/Mac SE/30	2399.
Microtek	
Microtek MSF-300GS Scanner	1589.
Microtek MSF-300Z Scanner	1998.
NEC	
Intersect CDR-35	419.
Qume	
Crystal Print Publisher	2900.
Seikosha America	
Seikosha Printer (dot-matrix)	235.
Sharp	
The Wizard	229.
ThunderWare	
LightningScan 400	385.
ThunderScan Plus	199.

HYPERWARE

Bantam	
Complete HyperCard Handbook	22.
Beacon Technologies	
HyperBible International Version	175.
HyperBible King James Version	145.



MacEnvelope 5.0 (SYNEX)
Prints labels or envelopes from your database or word processor address lists. MacEnvelope's WYSIWYG display, Postal Bar Coding, Desk Accessory and 100 preformatted templates (Avery et al.) makes short work of all your mailing chores. Stores up to 1600 addresses per file, sorted alphabetically or by ZIP code. **\$57.**

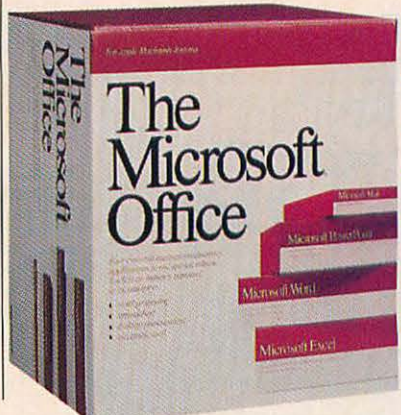
MacEnvelope Plus 2.0
Maintains up to 100,000 names per file. Provides additional list management features including comments, flags, and multilevel sorts. (business) **\$159.**

Kraft	
ADB Joystick Premium III (SE&II)	49.
QuickStick	39.
Trackball	79.
LYNX	
QuadLYNX Trackball	59.
MicroSpeed	
MacTrac ADB	NEW 75.
Micro Touch	
The UnMouse	189.
Mouse Systems	
A+ Mouse (SE/II) or (512, Plus) ... ea.	58.
Practical Solutions	
The Cordless Mouse	89.
Mouse Master	57.
Summagraphics	
Bit Pad Plus	319.

LANGUAGES

Digital, Inc.	
Smalltalk/V MAC	125.
Microsoft	
QuickBasic	64.

The Microsoft Office (Microsoft)
The Microsoft Office gives you everything you need to increase productivity, word processing (Microsoft Word), spreadsheet (Microsoft Excel), desktop presentations (Microsoft PowerPoint), and electronic mail (Microsoft Mail) - in one compact package! Each program is a top-selling stand alone product, and when used together, will make your entire office more efficient and productive. (business) **\$525**
Also available on CD-ROM **\$669.**



DataDesk International	
HyperDialer	39.
ICOM Simulations	
HyperTMON	59.
MicroMaps	
HyperAtlas	59.
Silicon Beach	
SuperCard 1.5	189.
Softstream International	
HyperHit	125.
Somak	
Script Edit	49.
Symmetry	
HyperDA 1.2	45.
TimeWorks	
HyperWorks Organizer	57.

INPUT/OUTPUT

Calcomp	
WIZ Tablet	159.
WIZ Pen	57.
WIZ Templates	ea. 33.
CH Products	
Mach IV Plus Mouse/Joystick	49.
Mirage Adaptor	35.
Roller Mouse ADB	75.
DataDesk Intl.	
DataDesk Switchboard	175.
Mac 101 Keyboards	129.
Forté Communications	
Remote Keyboard/Mouse	269.
Kensington	
New Turbo Mouse	109.
Keytronics	
MacPro Keyboard	118.

1990

WORLD-CLASS AWARDS

THE READERS OF MACWORLD MAGAZINE ARE A DISCERNING LOT; WE'VE ALWAYS BELIEVED THAT. AND AFTER LOOKING OVER THE FINAL TALLY FOR THIS YEAR'S WORLD-CLASS AWARDS CONTEST, WE'RE MORE CONVINCED THAN EVER. LISTED ON THE FOLLOWING PAGES ARE THE FORTY-FOUR MACINTOSH PRODUCTS THAT READERS VOTED AS THEIR FAVORITES. CONGRATULATIONS TO EACH OF THE 1990 WORLD-CLASS WINNERS.

BY SUZANNE STEFANAC





Each year, we solicit reader response by publishing World-Class ballots in our February and March issues. We provide the hardware and software categories, and our readers write in the names of Macintosh products they believe warrant World-Class status. The ballots are then counted by an independent tabulating service, Wilson Associates, and winners are announced at the Macworld Expo in Boston.

1990 HIGHLIGHTS

This is the fourth year that *Macworld* magazine has sponsored the World-Class Awards, and in looking at each year's winners, we find both patterns and surprises. Of our 44 1990 World-Class hardware and software winners, 27 were reader favorites last year as well. Fifteen products deserve special notice because they've been voted World-Class products all four years: the ThunderScan for the digitizer/scanner category; the Radius Full Page Display System for the black-and-white display category; Kensington Microware's Turbo Mouse series for input devices; Hayes's Smartmodem series for modems; Apple's ImageWriter II for dot matrix printers and LaserWriter II series for laser printers; Claris's FileMaker for database management and MacProject for project management; Aldus PageMaker for page layout; Microsoft Word for word processing, Works for integrated package, and Excel for spreadsheets; Symantec's More II for outline processing; FreeSoft's WhiteKnight (formerly Red Ryder) for general communications; and finally, in business accounting, Layered's Insight series won the first three years and the company's atOnce application won this year.

The Most Promising Newcomers for 1990—Hewlett-Packard's DeskWriter printer in the hardware division and Adobe Type Manager (ATM) in software—both provide Macintosh users with reliable, affordable output solutions. The Macintosh IIfx and the Macintosh Portable were strong hardware contenders, but ATM swept the software category. It is interesting to note that the spectrum of products voted Most Promising Newcomer was quite wide—72 hardware prod-

ucts each received one vote, as did 95 software products.

In two upsets, Wolfram Research's Mathematica scored higher than Abacus Concepts' StatView, another triple winner. And Aldus FreeHand replaced Adobe Illustrator as the readers' choice in the drawing/illustration/animation category.

AND THE WINNERS ARE

On the following pages, you will find the list of 1990 World-Class products grouped according to category. The product names in bold are the winners; below each winner we've listed additional products that received a significant number of votes in each category. The percentage associated with *Others* signifies the remaining votes—the higher the number, the greater the number of other contenders in the category. Also, because no reader voted in every category, we've included the percentage of respondents for each category. While the results can't be construed as an endorsement by *Macworld* magazine, they clearly reflect the preferences of our readers.

1990'S GRAND-PRIZE WINNERS

The World-Class contest thrives because readers take the time to respond. We are grateful to everyone who submitted a ballot. To thank our readers for participating, we

drew seven ballots at random from among those submitted to the contest and, in cooperation with winning hardware and software companies, these lucky readers will receive selections of this year's World-Class products.

Michael J. Mandala is the pastor of Christ the King Catholic Church in San Diego, California. A Mac owner since the first 128Ks in 1984, Father Mandala now uses a Mac SE for his parish work and in his consulting work with inner-city organizations in the San Diego area.

Fourteen-year-old **Jamie Morgan** of Kingwood, Texas, received a Mac Plus from his parents as a reward for getting straight A's in school last year. The Mac helps him keep up with his schoolwork—science is his favorite subject—and he hopes to someday be an astronaut.

Although **Gary R. Presley-Nelson** works in a mainframe environment at Tandem Computers in San Francisco, California, there are enough Macintoshes in his office to warrant the recent installation of AppleTalk. At home, Presley-Nelson has two Mac SEs and his wife, a dentist, has a Mac Plus at her office.

Amy Schroeter uses her Mac IIfx with a LaserWriter IINTX and an Apple Scanner to design newsletters, brochures, flyers, and in-house publications for Diesel Specialties in Esterville, Iowa. Her favorite software packages are MacDraw II, PageMaker, PixelPaint Professional, and Microsoft Word.

A resident of New York City, **Bernard Shanfield** is a practitioner of the Hellerwork Method, a type of bodywork pioneered by a student of Ida Rolf. To track his budget and take care of correspondence, Shanfield finds that Microsoft Works with a Mac SE and a LaserWriter IINT meets his needs quite well.

Ron Smith, a pediatrician in El Dorado, Arkansas, owns several Macintoshes—a IIfx, a Mac II, two Mac Pluses—and a LaserWriter Plus. Besides designing databases, forms, and a newsletter, Smith finds time to do some programming on the side.

Retired civil engineer **John N. Williams** of Front Royal, Virginia, donated his 128K Mac to his children and now relies on a 2MB Mac II with a GCC Personal LaserPrinter. His consulting firm, Neat Company, specializes in rural area mapping and in setting up emergency 911 databases. "I used to teach Lotus 1-2-3 to evening classes," Williams notes, "until I saw Excel on the Mac. Now I can no longer justify teaching MS-DOS-based spreadsheets when anyone can teach themselves using the Mac."

HARDWARE

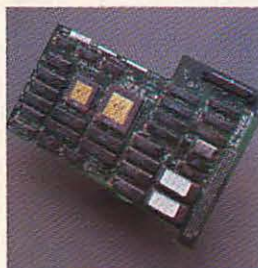
Product, Manufacturer % of votes



ALTERNATIVE MASS STORAGE

Data Pak series, Mass Microsystems	14
Bernoulli Portable 44, Iomega Corporation	11
Cirrus removable cartridge drives, La Cie	8
Ehman 44MB Removable Cartridge, Ehman	8
REO optical drives, Pinnacle Micro	7
Others	52
Total	100

(12% of respondents voted in this category)



CPU UPGRADE

Radius Accelerator 25, Radius	10
Mac SE/30 Upgrade, Apple Computer	8
50/030 Accelerator, DayStar Digital	7
MaraThon 030, Dove Computer	6
Others	69
Total	100

(10% of respondents voted in this category)



DIGITIZER/SCANNER

HP Scanjet series, Hewlett-Packard	18
ThunderScan, Thunderware	17
MSF-300Z, Microtek	15
Apple Scanner, Apple Computer	14
Others	36
Total	100

(22% of respondents voted in this category)

PHOTOGRAPHS BY LUIS DELGADO

Product, Manufacturer % of votes



DISPLAY — BLACK AND WHITE

Radius Full Page Display System, Radius	23
Radius Two Page Display System, Radius	21
Portrait Display, Apple Computer	13
ClearVue System, RasterOps	12
Others	31
Total	100

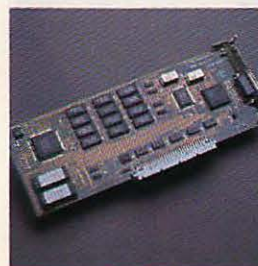
(16% of respondents voted in this category)



DISPLAY — COLOR

AppleColor High-Resolution RGB Monitor, Apple Computer	38
SuperMac 19-inch color monitor, SuperMac Technology	17
Radius DirectColor Series, Radius	13
Others	32
Total	100

(16% of respondents voted in this category)



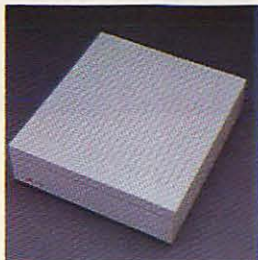
GRAPHICS BOARD

ColorBoard 264, RasterOps	31
Spectrum/24, SuperMac Technology	25
Others	44
Total	100

(10% of respondents voted in this category)

HARDWARE

Product, Manufacturer % of votes



HARD DISK (80MB OR LESS)

Apple Hard Disk SC series, Apple Computer	9
MacStack series, CMS Enhancements	7
DataFrame XP series, SuperMac Technology	7
Cirrus hard disks, La Cie	6
Others	71
Total	100

(35% of respondents voted in this category)



HARD DISK (ABOVE 80MB)

Rodime Plus series, Rodime Peripheral Systems	10
Cirrus hard disks, La Cie	8
DataFrame XP series, SuperMac Technology	5
Others	77
Total	100

(12% of respondents voted in this category)



INPUT DEVICE

Turbo Mouse series, Kensington Microware	41
Apple Mouse, Apple Computer	9
Mac-101 Enhanced Keyboard, DataDesk International	8
Apple Extended Keyboard, Apple Computer	6
Kurta IS/ADB Tablet, Kurta Corporation	5
Others	31
Total	100

(21% of respondents voted in this category)



PRINTER — COLOR

QMS ColorScript-100 series, QMS	42
HP PaintJet series, Hewlett-Packard	21
ColorQuick Ink-Jet Printer, Tektronix	11
Others	26
Total	100

(12% of respondents voted in this category)



PRINTER — DOT MATRIX

ImageWriter II, Apple Computer	62
DeskWriter, Hewlett-Packard	8
ImageWriter LQ, Apple Computer	7
WritelImpact Printer, GCC Technologies	7
Others	16
Total	100

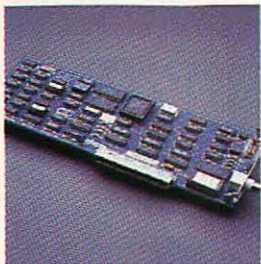
(25% of respondents voted in this category)



PRINTER — LASER

Apple LaserWriter II series, Apple Computer	55
Personal Laser Printer series, GCC Technologies	8
Business Laser Printer series, GCC Technologies	3
HP LaserJet series, Hewlett-Packard	3
Silentwriter, NEC	3
Others	28
Total	100

(37% of respondents voted in this category)



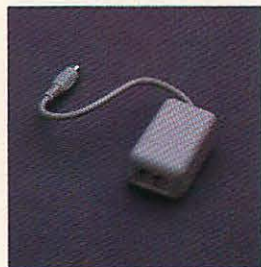
MICRO-TO-MAINFRAME COMMUNICATIONS

MacIrrma, Digital Communications Associates	28
MacMainFrame series, Avatar Corporation	12
Netway, Tri-Data Systems	10
Others	50
Total	100
(3% of respondents voted in this category)	



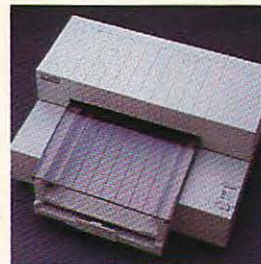
MODEM

Smartmodem series, Hayes Microcomputer Products	28
Practical Modem series, Practical Peripherals	18
Interfax, Abaton Technology	8
NetModem series, Shiva Corporation	7
SupraModem Series, Supra Corporation	5
Others	34
Total	100
(21% of respondents voted in this category)	



NETWORK

PhoneNet series, Farallon Computing	28
TOPS FlashBox, Sun Microsystems/TOPS Division	23
AppleShare, Apple Computer	8
Others	41
Total	100
(8% of respondents voted in this category)	



MOST PROMISING NEWCOMER — HARDWARE

DeskWriter, Hewlett-Packard	17
Macintosh IIci, Apple Computer	13
Macintosh Portable, Apple Computer	10
Personal Laser Printer series, GCC Technologies	7
Others	53
Total	100
(22% of respondents voted in this category)	

SOFTWARE

Product, Manufacturer % of votes

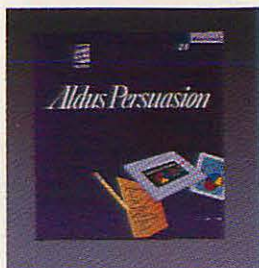


BUSINESS ACCOUNTING

atOnce, Layered	13
Insight Expert Accounting, Layered	8
MultiLedger, CheckMark Software	7
Simply Accounting, Computer Associates	6
Business Sense, Monogram Software	6
Others	60
Total	100
(15% of respondents voted in this category)	

SOFTWARE

Product, Manufacturer % of votes



BUSINESS PRESENTATION GRAPHICS

Aldus Persuasion, Aldus Corporation	42
PowerPoint, Microsoft Corporation	22
CA-Cricket Graph, Computer Associates	4
CA-Cricket Presents, Computer Associates	4
Others	28
Total	100

(24% of respondents voted in this category)

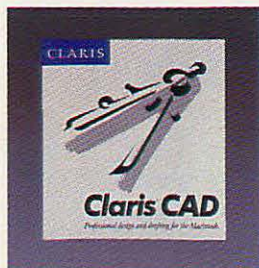


COMMUNICATIONS — GENERAL

MicroPhone, Software Ventures*	27
WhiteKnight, The FreeSoft Company*	20
Red Ryder, The FreeSoft Company	13
Smartcom, Hayes Microcomputer Products	9
Others	31
Total	100

(23% of respondents voted in this category)

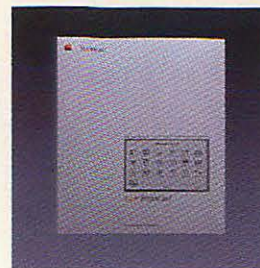
*MicroPhone received the greatest percentage of the vote (27%), but we declared a tie because there is an upgrade policy between WhiteKnight and Red Ryder (with a combined tally of 33%).



COMPUTER-AIDED DESIGN (CAD)

Clariscad, Claris Corporation	28
Minicad+, Diehl Graphsoft	13
Dreams, Innovative Data Design	8
Vellum, Ashlar	8
VersaCAD/Macintosh Edition, VersaCAD Corporation	6
Others	37
Total	100

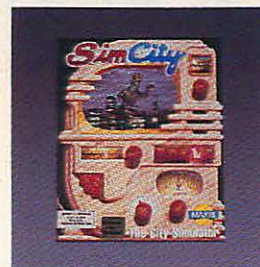
(13% of respondents voted in this category)



EDUCATION/TRAINING

HyperCard, Apple Computer	16
Where in the World Is Carmen Sandiego?	9
Brøderbund Software	
Reader Rabbit, The Learning Company	8
Voyager, Carina Software	6
Typing Tutor, Simon & Schuster Computer Software	4
Others	57
Total	100

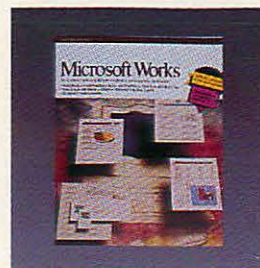
(13% of respondents voted in this category)



GAME

SimCity, Maxis Software	13
Tetris, Spectrum HoloByte	10
Crystal Quest, Casady & Greene	9
Beyond Dark Castle, Silicon Beach Software	7
Falcon, Spectrum HoloByte	6
Others	55
Total	100

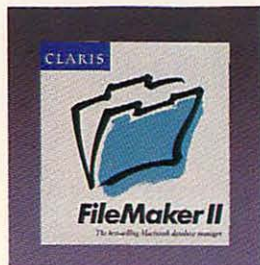
(13% of respondents voted in this category)



INTEGRATED PACKAGE

Microsoft Works, Microsoft Corporation	87
Microsoft Office, Microsoft Corporation	4
HyperCard, Apple Computer	3
Microsoft Excel, Microsoft Corporation	2
Others	4
Total	100

(20% of respondents voted in this category)



DATABASE MANAGEMENT

FileMaker, Claris Corporation	33
4th Dimension, ACIUS	22
FoxBase+ /Mac, Fox Software	10
Double Helix, Odesta Corporation	8
Others	27
Total	100
(33% of respondents voted in this category)	



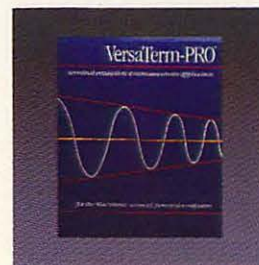
DESK ACCESSORY

Suitcase, Fifth Generation Systems	21
DiskTop, CE Software	18
QuickDex, Casady & Greene	4
Font/DA Juggler Plus, AISoft	3
SmartScrap & The Clipper, Solutions International	3
TypeAlign, Emerald City Software	3
Others	48
Total	100
(40% of respondents voted in this category)	



DRAWING/ILLUSTRATION/ANIMATION

Aldus FreeHand, Aldus Corporation	28
Adobe Illustrator, Adobe Systems	24
MacDraw, Claris Corporation	17
Canvas, Deneba Software	12
Others	19
Total	100
(47% of respondents voted in this category)	



MICRO-TO-MAINFRAME COMMUNICATIONS

VersaTerm-Pro, Synergy Software	30
WhiteKnight, The FreeSoft Company	16
MicroPhone, Software Ventures	7
MacIrm, Digital Communications Associates	6
Others	41
Total	100
(6% of respondents voted in this category)	



MULTIMEDIA

Director, MacroMind	56
HyperCard, Apple Computer	18
SuperCard, Silicon Beach Software	8
Others	18
Total	100
(11% of respondents voted in this category)	



MUSIC

Finale, Coda Music Software	23
Studio Session, Bogas Productions	10
Performer, Mark of the Unicorn	10
Vision, Opcode Systems	9
MacRecorder, Farallon Computing	8
Others	40
Total	100
(11% of respondents voted in this category)	

SOFTWARE

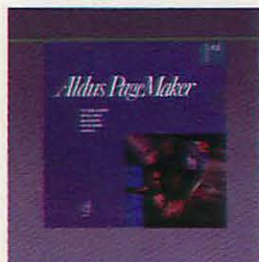
Product, Manufacturer % of votes



OUTLINE PROCESSING

More II, Symantec Corporation	51
Acta, Symmetry Corporation	24
MindWrite, Access Technology	8
Microsoft Word, Microsoft Corporation	6
Others	11
Total	100

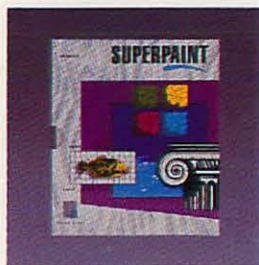
(12% of respondents voted in this category)



PAGE LAYOUT

Aldus PageMaker, Aldus Corporation	70
QuarkXPress, Quark	14
ReadySetGo, Letraset USA	9
Others	7
Total	100

(49% of respondents voted in this category)



PAINT — BLACK AND WHITE

SuperPaint, Silicon Beach Software	62
MacPaint, Claris Corporation	11
Studio/8, Electronic Arts	8
Canvas, Deneba Software	5
DeskPaint, Zedcor	3
Others	11
Total	100

(32% of respondents voted in this category)



PROJECT MANAGEMENT

MacProject II, Claris Corporation	69
KeyPlan, Symmetry	8
AEC Information Manager, AEC Management Systems	4
Focal Point, TenPoint0 (Activision)	3
Micro Planner Plus, Micro Planning International	3
Others	13
Total	100

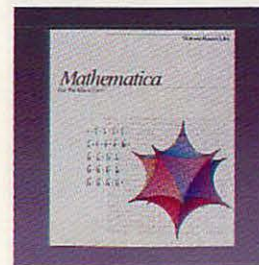
(9% of respondents voted in this category)



SPREADSHEET

Microsoft Excel, Microsoft Corporation	74
Wingz, Informix Software	21
Microsoft Works, Microsoft Corporation	2
Full Impact, Ashton-Tate	2
Others	1
Total	100

(50% of respondents voted in this category)



STATISTICS/MATH

Mathematica, Wolfram Research	31
StatView II/StatView SE+Graphics, Abacus Concepts	18
Data Desk Professional, Odesta Corporation	11
Theorist, Allan Bonadio Associates	6
Others	34
Total	100

(11% of respondents voted in this category)



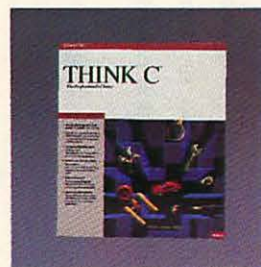
PAINT — COLOR

PixelPaint, SuperMac Technology	44
Studio/8, Electronic Arts	19
SuperPaint, Silicon Beach Software	15
Canvas, Deneba Software	10
UltraPaint, Deneba Software	5
Others	7
Total	100
(19% of respondents voted in this category)	



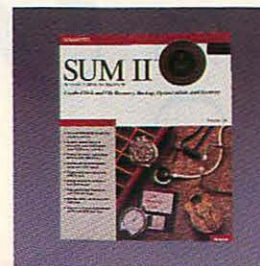
PERSONAL FINANCE/TAXES

MacInTax, SoftView	36
Quicken, Intuit	36
MacMoney, Survivor Software	11
Managing Your Money, Meca Ventures	9
Dollars & Sense, Monogram Software	4
Others	4
Total	100
(32% of respondents voted in this category)	



PROGRAMMING LANGUAGE

Think's Lightspeed C, Symantec Corporation	42
Think's Lightspeed Pascal, Symantec Corporation	9
HyperTalk, Apple Computer	6
Others	43
Total	100
(23% of respondents voted in this category)	



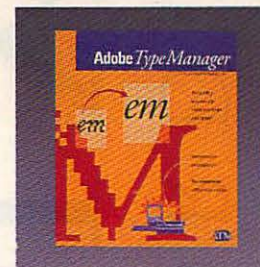
UTILITIES — DISK AND FILE

Symantec Utilities for Macintosh (SUM), Symantec Corporation	34
DiskTop, CE Software	13
PC Tools Deluxe/MacTools, Central Point Software	5
DiskExpress, AISoft	5
Others	43
Total	100
(39% of respondents voted in this category)	



WORD PROCESSOR

Microsoft Word, Microsoft Corporation	66
WriteNow for Macintosh, T/Maker	12
MacWrite, Claris Corporation	12
WordPerfect for the Mac, WordPerfect Corporation	3
FullWrite Professional, Ashton-Tate	2
Others	5
Total	100
(74% of respondents voted in this category)	



MOST PROMISING NEWCOMER — SOFTWARE

Adobe Type Manager, Adobe Systems	27
UltraPaint, Deneba Software	4
Wingz, Informix Software	4
Type Align, Emerald City Software	3
TypeStyler, Brøderbund Software	3
Other	59
Total	100
(33% of respondents voted in this category)	

Which word
processor takes the
laurels when it
comes to advanced
document events like
footnotes, merge,
indexes, or styles? Six top
packages compete
in a septathlon that tests
the limits of their
programming prowess.

WORD PROCESSOR OLYMPICS

This isn't an Olympic year for sports fans, but for those who use a Macintosh word processor, every year looks like an Olympic year. Annually, like earnest trainers, word processor designers send forth the fruits of months of hard labor. Out in the marketplace, the programs compete in a variety of events, and the one with the best overall score takes home the gold. And every year, even before the medals are handed out, the trainers go back into a huddle and start redesigning new, even more powerful, competitors.

This year's 1990 Word Processor Olympics eschews minor-league contests like multiple columns, headers and footers, page numbers, finding and changing. No, sir. We're talking tough, world-class competition here: footnotes, tables

of contents, glossaries, indexes, cross-references, mail merge, and style sheets. While you may not choose a word processor solely on the strength of its advanced features, if one or more of these special skills are essential to your work, a program's standing in the advanced competition is at least as important as its overall score.

This year's contestants range from heavyweights Microsoft Word 4, WordPerfect 1.0.3, Full Write Professional 1.1, and newcomer Nisus 2.03 to bantamweights WriteNow 2.2 and MacWrite II. (WordPerfect 2.0, scheduled to ship this fall, and Nisus 3.0, which may be available by the time you read this, were not available for review.) Here's my report on this year's winners and losers from *Macworld's* seat in the press box.

BY ROBERT C. ECKHARDT



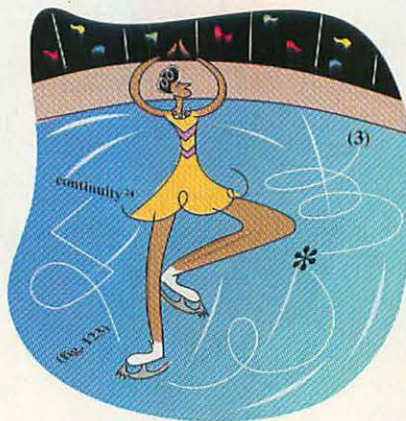
Footnotes and Endnotes

Footnotes and endnotes are to writers what compulsory figures are to figure skaters: an art, a science, a pain in the ankle. But while skaters perform compulsory figures pretty much the same way they always have, writers are now aided by footnote and endnote automation.

Footnote automation is the only Olympic-level function found in all major Macintosh word processors. At its most basic, footnote automation (and to a lesser degree, endnote automation) operates the same way in all programs. You place the insertion point in the main text, select a command, and then enter the text of the footnote. The word processor does everything else: it enters the footnote reference in the main text and at the beginning of the footnote; it numbers the footnote according to the current sequence; it places the footnote at the bottom of the page, and continues it to the next page if necessary; and it readjusts the main text to accommodate the note. Compared to doing footnotes the old-fashioned way, even this basic level of automation is little short of a miracle.

For a perfect 10, however, the judges require more than just a miracle. They give points for the following: user-definable symbols (such as an asterisk) as well as autosequenced numbers for references; the ability to set a document's starting footnote

number and/or reset footnote numbers back to 1 at each new page or document division (such as a new chapter); a choice of reference number configurations (such as ⁸ or ⁽⁸⁾); the ability to adjust the space between the



main text and footnotes; control over when and how footnotes are continued (set the minimum number of footnote lines that must remain on a page when the note breaks, for example). Top-class contenders must juggle these and other options and make it look easy (see "The Footnote Finals").

The performances of WriteNow and MacWrite in this event are clearly not top-class. WriteNow doesn't support endnotes at all, for example. Nor does it offer footnote styles or symbol references or allow you to reset footnote numbers within a document.

MacWrite II is one of the few programs in which you see, enter, and edit footnotes and endnotes in the main document window. Otherwise, its footnote and endnote function is not much more sophisticated than WriteNow's.

Like MacWrite, Nisus supports either footnotes or endnotes, but not both in one document. But Nisus surges ahead of both WriteNow and MacWrite by allowing you to: reset footnote numbering at each new page or anywhere within a document; adjust the space between footnotes and the main text; change the appearance of the separator; select from several different reference number configurations; and control footnote continuation. Nisus stumbles, however, in its lack of editable footnote styles, thus forcing you to format reference numbers and notes one by one.

Although each falls short of perfection, Word, WordPerfect, and FullWrite Professional amass the most points in this event. All three programs insert numbers in sequence when you ask for a footnote, but WordPerfect can also insert letters, or symbols if you've defined a sequence for them. The program also offers the widest choice of reference-number configurations, and offers useful controls for the appearance of the separator, the distance between footnotes and text, and footnote continuation. This promising start is marred, however, by WordPerfect's inability to display foot-

THE FOOTNOTE FINALS

	FullWrite	MacWrite II	Nisus	Word	WordPerfect	WriteNow
Supports endnotes	●	●	●	●	●	○
Place endnotes at document divisions	●	○	○	●	○	○
End- and footnotes in same document	●	○	○	○	●	○
Allows reference symbols	●	●	●	●	●	○
Set starting reference number	●	●	●	●	●	●
Restart numbering each page	○	○	●	●	●	○
Restart elsewhere within document	●	○	●	●	●	○
Displays footnotes in main window	●	●	●	●	○	●
Enter and edit in main window	○	●	○	●	○	○
Offers choice of reference-number configuration	●	○	●	○	●	○
Editable style for all references	○	○	○	●	●	○
Editable style for all foot- and endnote text	●	○	○	●	○	○
Adjust space between notes and text	○	○	●	○	●	○
Editable footnote separator	○	○	●	●	●	○
Controls for footnote continuation	○	○	●	○	●	○

● = yes ○ = no ▸ = partially implemented

notes in the main document window and to list endnotes at the end of a document division. The program also lacks editable footnote styles (a problem WordPerfect 2 is supposed to fix).

One reason Word's footnote function is a leader is that the program provides built-in styles, which make footnote and reference formatting easier than in any other program. In addition, Word is the only program that places an editable continuation notice at the split in a continued footnote. Word disappoints, however, because footnotes and endnotes are mutually exclusive within a document, and Word lacks reference number-configuration options, controls over spacing between footnotes and main text, and footnote continuation controls. FullWrite Professional stands up well against Word and WordPerfect, and it alone can refer to a single footnote or endnote in two or more places. But FullWrite falls short as well; it lacks spacing and continuation controls, an editable separator, and an easy way to reset footnote numbers back to one at each new page.

The Winners: Overall, footnote fetishists will find more than enough of what they crave in any of the three medalists. For their combination of useful features, user control, and ease of use, Word and FullWrite tie for the gold. WordPerfect actually offers more options and greater control, but several significant omissions and a relatively high level of difficulty relegate it to the bronze.

Document Merge

The second most widely contested event in the Word Processor Olympics is mail merge; of the six entrants, only Nisus cannot perform mail merge (Paragon promises that Nisus 3 will remedy this deficiency). Mail merge, of course, is the process by which names, addresses, and other information are copied from a data document and inserted in the indicated locations in multiple copies of a main document. Although the pseudo-personal touch provided by merged documents fools no one these days, they are de rigueur for everything from annual holiday newsletters to fund-raising solicitations.

One of the more difficult aspects

TRACK AND FIELD EVENTS: DOCUMENT MERGE

	FullWrite	MacWrite II	Word	WordPerfect	WriteNow
Automated code entry	●	●	○	●	○
Conditional (IF, THEN) instructions	○	●	●	○	●
Other special instructions	○	○	●	●	●
Reads files from other programs directly	●	●	●	○	●
Merges subset of records in data document	○	●	●	○	●
Prints merged documents to disk	○	●	●	●	●
Sends merged documents directly to printer	●	●	●	●	●

● = yes ○ = no ● = partially implemented

of mail merge is creating and entering the needed merge codes so the program knows what data to put where in the main document (such as insert a name after the salutation *Dear*). Word and WriteNow use identical merge codes, and in both code entry is largely a manual affair. In this regard, Word and WriteNow are sorely in need of an interface-lift. Code entry in FullWrite and WordPerfect is semi-automatic (you select codes from a dialog box or menu) and thus a little easier; neither could be called easy, however, since careful, manual setup is still required. MacWrite, which automatically creates a list of preformatted codes, is the clear winner in this arena (see "A Field Kit for Mail Mergers").

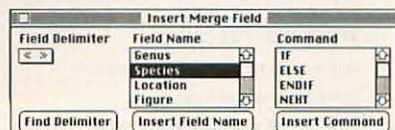
Data codes (names, addresses, phone numbers) are one type of merge code; conditional and special instructions are another. Conditional codes can be difficult to master, but they enable you to do such things as establish conditions under which certain text is or is not printed (for example, you might want to add a request for an especially large contribution if the income figure in a data document is over a certain amount). Special instructions can, for example, cause the program to ask for input during the merge process, or insert the contents of some third document (a contract clause, perhaps) in the merge document.

FullWrite trails badly in this event, since it supports neither conditional nor special instructions (see "Track and Field Events: Document Merge"). MacWrite offers standard conditional instructions only. WordPerfect supports special instructions, but frankly, its merge facility is about as confusing as they get. Ultimately, Word and

WriteNow are way ahead of the others here, since they support a wide and versatile variety of both conditional and special instructions.

All the programs reviewed here can use data exported from spreadsheets or databases. Most read exported tab- or comma-delimited text files directly. FullWrite can read unconverted dBase Mac files as well, while WordPerfect requires that all exported data files be processed by a special conversion utility. Most programs can either send merged documents directly to the printer or "print" them to disk (create a document containing all the merged files). FullWrite alone cannot print to disk, and in WordPerfect, sending the merged documents directly to the printer requires special coding. In both WordPerfect and FullWrite, the merge command always creates a complete set of merged documents; in the other programs, you can merge a subset of the records in the data document if you prefer.

The Winners: Document merge in identical-cousins Word and WriteNow is currently unbeaten (but certainly not unbeatable). These two front-runners, which offer a strong



A Field Kit for Mail Mergers

MacWrite automatically reads a mail merge data document and creates all the corresponding merge codes (left scrolling list). The codes, together with the conditional instructions (right scrolling list), form a merge construction kit that eliminates many common errors that drive mail mergers crazy.

combination of maximum power and only moderate difficulty, would be neck-and-neck but for the fact that Word's table feature can greatly facilitate the creation of a data document. So Word gets the gold and WriteNow the silver. MacWrite's exceptional ease of use but less-powerful functions take the bronze.



Styles and Style Sheets

Writing without style sheets is like running the marathon with one shoe; it can be done, but why do things the hard way? A style specifies a set of formats ranging from font and font size to paragraph indents and line spacing. A style sheet stores a group of styles and their definitions. With a style, you can apply numerous formats with a single command. Even more important, because styles maintain links to their definitions, when you change a style definition in the style sheet, you simultaneously change the format of all text currently in that style. Simple in concept, styles and style

sheets are undoubtedly the most valuable players in any formatting team.

WriteNow, WordPerfect, and MacWrite are disqualified from this event since none of them support true styles (WordPerfect plans to include them in WordPerfect 2). Nisus offers styles, but they're still in the 98-pound-weakling stage, since they can control character formats, such as font and font size, but not paragraph formats, such as justification or indents (Paragon says this limitation will be lifted with Nisus 3).

Therefore, the only real contest in this event is between FullWrite and Word (see "Style-Sheet Meet and Glossary Games"). FullWrite Professional offers both an array of built-in styles (for document elements such as headers, footnotes, and tables of contents) and user-defined custom styles. In addition to the usual absolute style definitions, such as 14-point Palatino with 18-point leading, you can also create relative style definitions, such as 25 percent greater leading and 3 points larger font size.

While FullWrite's styles are impressive, Word's performance is better in almost all respects. Word's integration of built-in styles and document elements (including outline headings, index levels, and table-of-contents entries) gives it a definite edge. Word's styles are also distinguished by the way in which you can link styles to one another (so you can change the font in all styles, for example, by changing the font in one base style); the fact that you can specify that one style always follow another style (standard

paragraph style follows subhead style, say); and the ease with which you can call up styles from the keyboard, the menu, or the ruler.

The Winners: Word's overall approach to style sheets is so thoughtful, well-integrated, and useful that Word easily gets the gold. FullWrite brings home a silver, and Nisus—a very distant third for now—merits a bronze.

Glossaries

Glossaries are electronic lockers containing often-used graphics or laborious-to-type text. Because they're tagged with, and called up by, simple abbreviations, glossary entries can be inserted in a document quickly and easily. Type "usoc," say, and a glossary can quickly replace it with *United States Olympic Committee*. Ideally, entries useful for different tasks can be stored in different glossary files (one for contracts, for example, and another for horse-race handicapping). You should be able to store glossary files separately from document files and open and close different glossary files as needed.

Neither MacWrite nor WriteNow has glossaries (although 80 bucks will buy you Thunder II, an excellent add-on spelling checker with a built-in glossary function). WordPerfect doesn't support glossaries either, although its macro function lets you create glossary-like macros.

Nisus, FullWrite, and Word have full-fledged glossaries. Nisus and Word glossaries can contain both text and graphic entries, and in both these programs glossary text maintains its style sheet links. In FullWrite, glossaries store only text, and style links to glossary text are severed.

You can open only one glossary at a time in Nisus, but Nisus's glossaries are extremely easy to work with (see "A Gold Medal Glossary"). You can open any number of glossaries in Word, but reviewing and editing entries is no easy task. In FullWrite any number of glossary files can be open at once, and glossary entries can be easily reviewed and edited.

In all three programs, you can have the program immediately flesh out glossary abbreviations as you type. Nisus is unusual in that it can also wait until you finish typing a section of

STYLE-SHEET MEET AND GLOSSARY GAMES

	FullWrite	Nisus	Word
STYLES AND STYLE SHEETS			
Built-in styles for major document elements	●	○	●
Styles linked to other styles	○	○	●
Styles defined relative to existing formats	●	○	○
Apply styles with menu commands	●	○	●
GLOSSARIES			
Stores graphics and text	○	●	●
Opens more than one glossary at a time	●	○	●
Replace glossary abbreviations in batches	○	●	○
Editable-glossary entries	●	●	○
Glossary displays entries in full	●	●	○

● = yes ○ = no ▸ = partially implemented

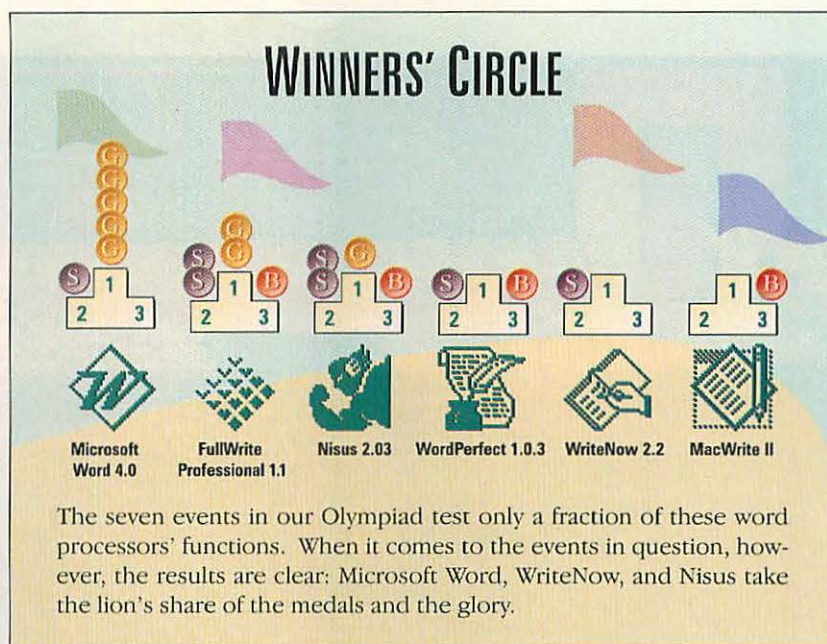
sends the text to a special database. When you reach the point in the document where you want a reference to appear, you go to the reference database and select the previously marked text (such as "Table 5") or its location in the document. To create a phrase like "see Table 5 on page 49," you can select both types of cross-reference. Location cross-references are updated automatically. When changes to text affect cross-references (such as when Table 5 becomes Table 7) you must update the reference with a special command.

Because it's tied in with FullWrite's automatic numbering of classified elements, cross-referencing in FullWrite requires an additional step. First you create a classification category (such as tables, figures, or text), then you classify the item to be cross-referenced. Finally, you enter the cross-reference, which can include the item name and number, or the page number, or both (see "Writing Yourself a Citation"). Classification numbers (such as figure numbers) are displayed and automatically updated in the cross-reference; page numbers are not displayed in the document window, but they are updated when you print.

The Winners: The cross-reference functions in either FullWrite Professional or Nisus can be helpful, though a combination of both programs' abilities, plus the ability to reference material in other documents, would be closer to the ideal. Nonetheless, cross-references in FullWrite are part of a larger scheme in which items can be numbered and compiled in a list automatically. As a result, FullWrite's cross-references pack a significant punch, and get the gold. But Nisus manages to score, too, in its ability to cross-reference actual text, such as figure captions or subheads, and earns a silver medal as a result.

Cue Music, Raise Flags

Just as the Olympics can't include every sport known to humankind, our Word Processor Olympics doesn't cover every aspect of word processing. But in the seven events in this Olympiad, the final tally is clear: Word is first; FullWrite is a distant second; and Nisus takes third (see "Winners' Circle"). Of course, just as the num-



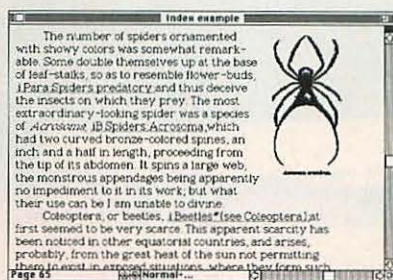
ber of medals on an athlete's chest doesn't always tell you how well he or she functions in the real world, how well a word processor fits your needs is only partly related to the advanced events covered here.

WordPerfect's low score may well reflect the opinion of many Macintosh users, for example, but many people migrating from PC compatibles apparently find the program to be just their cup of tea. In contrast, FullWrite's high medal count doesn't excuse its sluggish performance on Mac Pluses and SEs or the program's insatiable appetite for RAM. And Nisus's good showing doesn't take into account its poorly organized menu structure and hastily slapped-together feel (or its convenient built-in graphics program, for that matter).

But if you regularly use any of the advanced features described here, pick a word processor that has both good basic skills (see "Words, Words, Everywhere" in the September 1989 *Macworld*) and mastery of the finer points. Doing so will put you, too, in the winner's circle. **M**

See *Where to Buy* for contact information.

.....
Robert C. Eckhardt is a contributing editor of *Macworld* and *Publish and the author* of *The Fully Powered Mac (Brady)* and other books.



Tough Guys Do Compile Indexes

Word's manually entered index codes are daunting but powerful. They can be used to create multilevel indexes (like the three-level entry code in line 5), to specify bold or italic page numbers for special-interest entries (line 8), and to enter cross-references (line 15) or page ranges instead of a simple page number. The codes here are underlined, which means they're formatted as hidden text and do not appear when you print the main text.

(see Figure 2, page 1)

Preamble:	Delimiters:	Separator:
<input checked="" type="radio"/> 'see'	<input checked="" type="radio"/> 'I'...'I'	<input checked="" type="radio"/> '...'I'...
<input type="radio"/> 'refer to'	<input type="radio"/> 'I'...'I'	<input type="radio"/> '...'an'...
<input type="radio"/> None	<input type="radio"/> None	<input type="radio"/> None
Citation Contents:		
<input type="radio"/> Category		
<input checked="" type="radio"/> Category and Page		
<input type="radio"/> Page		
<input type="button" value="Insert Citation"/>		
<input type="button" value="Cancel"/>		

Writing Yourself a Citation

In FullWrite, you construct cross-references (citations) by selecting options, building-block-style, in the Citation dialog box. FullWrite displays the citation at the top of the dialog box and, when you press Return, inserts the citation in the text as a single, uneditable object.



TOM WOLFF

*Liz Vantrease used the Mac to transform an empty stage into a room full of music. One act of her opera, *Liz*, composed and scored on the Mac, was recently performed at the Virginia Commonwealth University Performance Arts Center.*

WITH A LITTLE HELP FROM MY MAC

For most people, the Mac makes things easier. For people with disabilities, it can make the impossible possible.

by Brita Meng

Liz Vantrease, of Richmond, Virginia, is writing an opera.

In 1985, after 13 years as a newspaper reporter and editor, she followed a lifelong dream to the master's program in music composition at Virginia Commonwealth University. Halfway through, she was diagnosed with amyotrophic lateral sclerosis (ALS), or Lou Gehrig's disease.

Knowing Vantrease would eventually lose the strength to handwrite her music, two friends gave her a Mac on an indefinite loan. Using Mark of the Unicorn's Professional Composer to write and print scores, she completed her degree in 1988. Although Vantrease no longer works full-time, she is now a free-lance music critic for the *Richmond News Leader*.

"Without my computer, I'd be in a lonely, silent, boring world. Three scenes of my opera, a suite for piano, and a piece for flutes wouldn't exist—because I wouldn't have been able to write them down. Because ALS impairs my speech, I communicate by typing messages on my computer to friends, family, doctors, and my computer bulletin board pals."

She continues, "My Mac helps me keep up with world news and with trends in music (through a music bulletin board). I get support and helpful advice from folks in the disabilities forum on CompuServe. In short, my computer and modem give me a window to the world into which my feeble legs and arms can no longer carry me."

Vantrease isn't the only person who feels that way about her Mac. Computers now enable disabled people to work without leaving

home, communicate without being able to speak, and read without being able to turn pages or see. For many individuals with disabilities, computers are more than just an easier way to do things. They're a way to achieve independence and maintain self-esteem.

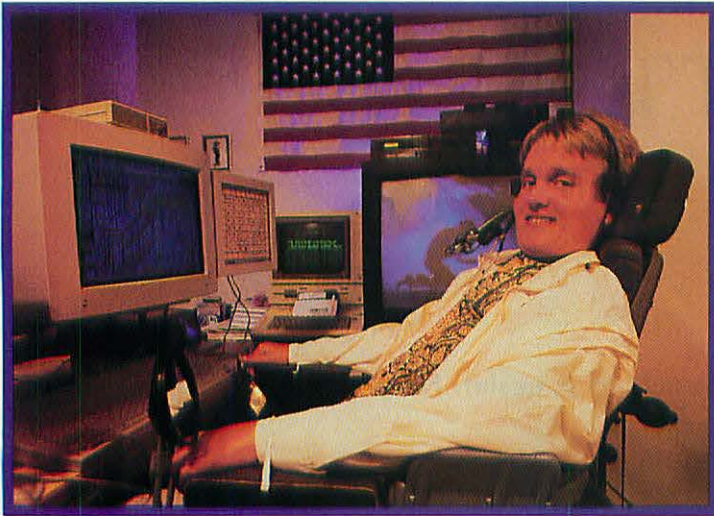
Many Needs, Many Solutions

According to U.S. government estimates, 15 percent of the population is disabled—over 42 million children and adults in this country alone. An additional 750 million disabled people live in other parts of the world. That total is growing by more than a half million people every year. In fact, one family in three is dealing with some form of disability.

Disability can be defined as a lack of fit between a person's goals, his or her capacities, and the resources in the environment. For a wheelchair user, disability is not being confined to a wheelchair, it's being confronted with a flight of stairs. For a child with dysgraphia (a fine-motor problem that affects handwriting), disability is not poor handwriting, it's having a pencil as his or her only available writing tool.

There is a growing sense among people with disabilities, their families, doctors, and therapists that something almost magical can happen when people with disabilities encounter a computer. The problem is how to make that magic work for a particular person (see "Finding Resources"). With the right equipment, computer access can expand an individual's abilities and increase his or her independence at home, at work, and at school.

**"MY COMPUTER
GIVES ME A
WINDOW TO THE
WORLD INTO
WHICH MY FEEBLE
LEGS AND ARMS
CAN NO LONGER
CARRY ME."**



JOSEPH RODRIGUEZ

André Alm is working on a project called the Smart House System for Swedish Electrolux (see "Enabling Electronics"). The Smart House will make it easier for disabled people to control their home environments.

There are currently hundreds of specialized products—keyboard guards, voice synthesizers, head pointers, chin switches, braille printers—that enable people with all levels of disabilities to use the Mac and other computers. But it's important to remember that not all potential solutions bear labels that read "special education" or "rehabilitation." In fact, off-the-shelf products such as Kensington Microware's Turbo Mouse trackball are popular and make very cost-effective adaptive devices. Software products such as CE Software's QuickKeys can help some users address dexterity difficulties, and Apple's own system software helps others.

Friendly Features

Many design features of the Macintosh and the Mac interface bypass the effects of physical challenges. One of these features is the humble mouse. "It's not an exaggeration to say that my Macintosh saved my sanity after I was forced to retire from the firm and the active practice of law," states Steve Magleby, a Salt Lake City attorney with multiple sclerosis (MS). "At that time, I felt completely cut off from the outside world because I could no longer write legibly or use a regular typewriter. However, after getting my first Macintosh some months after retiring, I was able again to do things, such as write letters, some small legal tasks, and take care of finances—primarily because of the interface and mouse."

In addition to the mouse, Apple has built in several features that make the Mac easier to operate for disabled users. Some are obvious: the Control Panel assists users with limited dexterity by letting them turn off the keyboard's Key Repeat feature. Hearing-impaired or deaf users should be aware that the Mac beep is also user configurable from the Control Panel. Turn the volume down completely and the computer will start to signal alerts with a menu-bar flash.

EasyAccess, a piece of System software shipped with every Mac, provides two utilities, Sticky Keys and Mouse Keys. Sticky Keys gives one-fingered typists the ability to complete commands like ⌘ -Option-B. Mouse Keys turns the numeric keypad into a full-functioning mouse; keys on the keypad direct the cursor around the screen (for more information on these utilities, refer to your Macintosh manual).

Just being able to write with 24-point type and then print at 12-point is a big advantage for visually impaired users. In addition, Apple's CloseView system utility enlarges screen contents up to 16 times normal size. This feature can assist not only the visually impaired, but anyone sitting farther than usual from a monitor—in a wheelchair or a bed, for example.

Other features are less obvious. Unlike the IBM PC, Apple's floppy disk drives have no latches. And when a disk is ejected, it's pushed out far enough so that it's easy to grasp. Although the Mac Plus and SE power switches are difficult to reach for many users, the Mac II family can be turned on from the keyboard.

Mac Adaptability


For some individuals, these built-in features are not sufficient to provide access. Fortunately, the large market represented by people with disabilities, along with encouragement from the federal government (see "Statutes of Liberty"), has induced vendors to make a wide variety of adaptive peripherals available.

André Alm is a 23-year-old computer science student at the University of Västerås in Västerås, Sweden. "Up until 1978 I led the life of a normal, healthy young boy. In October of that year, while climbing a tree in my garden, I fell to the ground and broke my neck." As a result, Alm is paralyzed from his shoulders down.

Alm bought his first computer, an Apple IIe, in 1984; late in 1985, he got his first Mac. "Prior to owning a computer I used a normal typewriter with a stick in my mouth. That was very cumbersome, and I could not, for instance, draw. As the computer is such a flexible tool, I can do many things I could not do before." For a mouse, Alm uses Prentke-Romich Company's HeadMaster device, which consists of a headset and a transceiver that monitors head movements

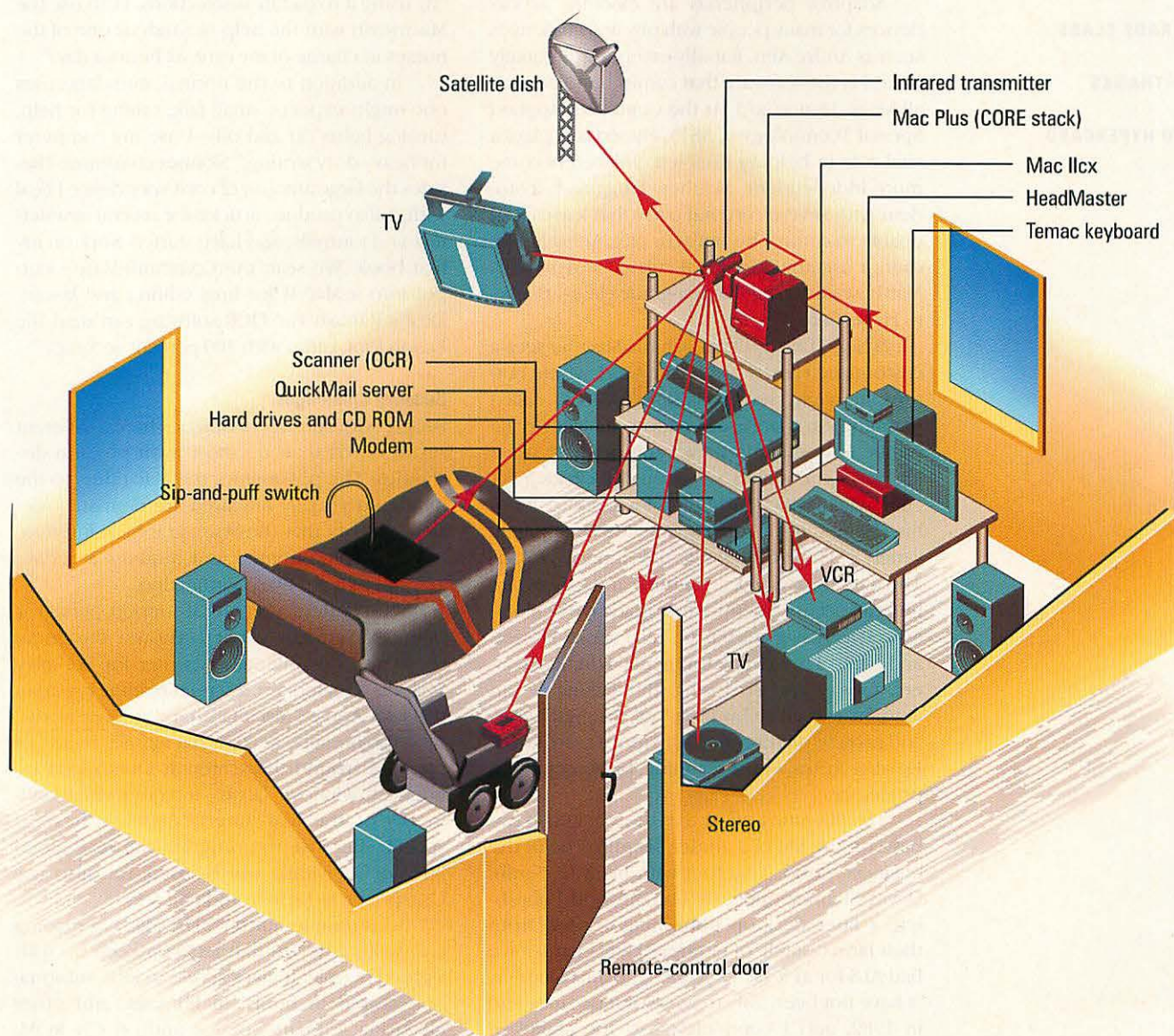
"IT'S NOT AN
EXAGGERATION
TO SAY THAT
MY MAC SAVED
MY SANITY AFTER
I WAS FORCED
TO RETIRE."

ENABLING ELECTRONICS

 CORE network

A prototype of the Smart House System André Alm is helping to design, his own room in Västerås, Sweden, enables Alm to work, play, and communicate. The heart of the system is the CORE universal appliance controller, developed by Steve Wozniak's company CL9 (CORE devices are in red). A HyperCard stack in a Mac Plus acts as an interface for the CORE, which communicates with the other devices in the room via infrared transmissions. Alm accesses the CORE stack either through Timbuktu and LocalTalk from his Ilcx, or

via a keyboard wired to a sip-and-puff switch that reaches to the bed. (The stack scans options, enabling it to be controlled by only two commands.) Another CORE device is attached to Alm's wheelchair. Using the COREs, Alm can operate his TV, satellite dish, VCR, stereo, and tape player from his bed, wheelchair, or Ilcx. He can also lock and unlock doors, and soon he will have the ability to control lights and a burglar alarm.



**MATTHEW, A
STUDENT WITH
SEVERE CEREBRAL
PALSY, IS IN
A REGULAR FIRST-
GRADE CLASS
—THANKS
TO HYPERCARD.**

along with a puff switch (which users blow into) for making selections.

For keyboard emulation he uses a Swedish product called a Temac, manufactured by RehabCenter AB. The Temac has 100 LEDs, each corresponding to a keyboard key. When Alm wants to type a letter, he highlights a particular LED key, and blows into the HeadMaster puff switch to select that character. "I have used several software keyboard-emulation programs," says Alm, "but those weren't 100 percent compatible with all programs. With the Temac keyboard I can type about 100 keystrokes per minute." With his head mouse and keyboard, special design controls, and a custom HyperCard stack, Alm now uses three Macs to control his home environment, open doors, dial the phone, and operate his stereo, TV, and VCR (see "Enabling Electronics").

Adaptive peripherals are essential access devices for many people with physical challenges such as André Alm. Rapidly emerging as equally critical is the software that comes bundled with all Macs: HyperCard. At the Center for Applied Special Technology (CAST), HyperCard plays a vital role in helping disabled children become more independent. Matthew Huggins is a student with severe cerebral palsy that leaves him unable to control his limbs or talk. Although he cannot use any traditional curricular materials, Matthew is in a regular first-grade class—thanks to HyperCard.

When Matthew turns on his Mac, he sees a customized HyperCard Home Card, where buttons highlight sequentially (a process called scanning) so that he can choose the activity he wants. Although Matthew can't point or use a keyboard, he makes selections by clicking his chin switch, which substitutes for a mouse. From his Home Card, Matthew can choose among a variety of HyperCard stacks developed by CAST. Through these stacks, Matthew and others like him can access an entire first-grade curriculum, as well as play games, type, read sports stories, and control home environmentals (lights, heaters, radios, and so forth). By clicking on an icon, he can go to his library of scanned books and browse pictures or hear stories read aloud. He also writes with a scanning, on-screen word processor.

The liberating effect that the Macintosh can have on the life of a student is mirrored in the business world. Together with his wife, Sarah, David Skinner operates Thrushwood Publishing, a laser desktop publishing service, from their farm outside of Ottawa. "I am 43 and have had ALS for at least 12 years," explains Skinner. "I have not been able to write or type since late in 1982, and I completely lost the ability to speak last year. I am quadriplegic, ventilated

[need assistance to breathe], and dependent on a stomach tube for feeding. I do, however, have near perfect hearing and eyesight."

To communicate, Skinner uses the Communi-Mate by Wells & Ryan of Indian Creek, Illinois. Communi-Mate is a computer based, menu-driven alternate communication and environmental-control system that can be operated with a single switch. It's connected to Skinner's own computer system—Thrushwood uses a Mac for desktop publishing—which consists of a Laser 128EX computer (Apple IIe clone), a Votrex speech synthesizer, a Radio Shack household appliance controller, and a Laser 190A dot matrix printer. Skinner operates the Communi-Mate by using an eyebrow switch to select options when they highlight from available menus: signal, text composition, environmental control, medical options, and basic conversation. "By using it to dictate instructions, I can use the Macintosh with the help of Sarah or one of the nurses in charge of my care six hours a day."

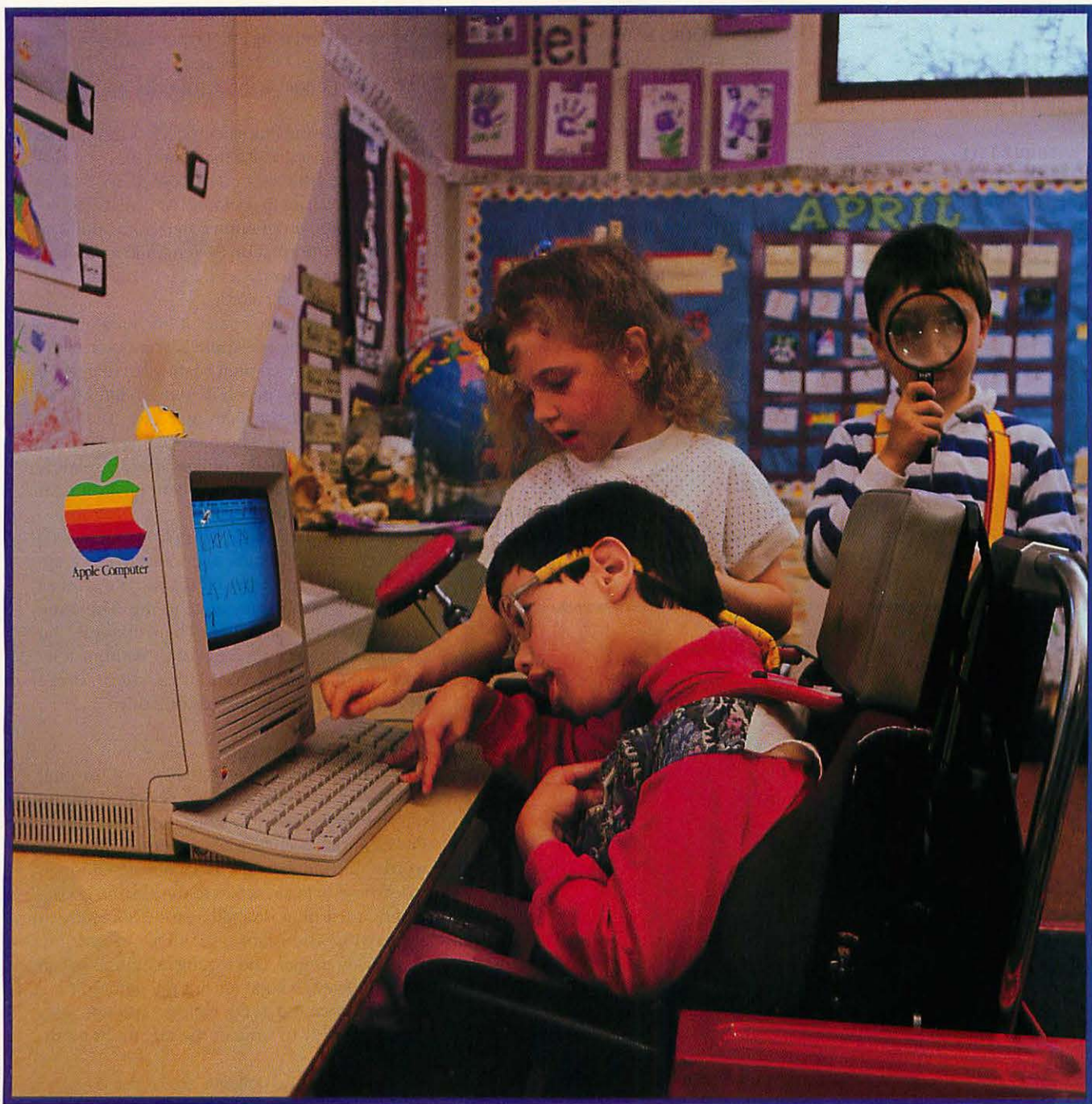
"In addition to the normal, mundane uses one might expect—small talk, calling for help, turning lights on and off—I use my computer for heavy duty writing," Skinner continues. "Besides the large amount of correspondence I deal with, I also produce articles for several newsletters and journals, and have started work on my first book. We scan the Communi-Mate's output into a Mac II for final editing and layout. Dest's Publish Pac OCR software can read the Epson font, often with 100 percent accuracy."

Sensory Challenges

People with sensory disabilities have a different set of needs than do those with physical disabilities. The possibilities the Mac offers to the blind and visually impaired are dramatic—despite the fact that the Mac's graphical interface is so visually oriented and requires a certain amount of hand-eye coordination.

Marc Sutton, a technical-support person at Berkeley Systems, is blind. He was the prime tester and documentation writer for Berkeley Systems' Outspoken, a screen-reading program that uses Apple's Macintosh to pronounce words. With the numeric keypad as a mouse, users can navigate around the screen as Outspoken announces "window," "icon," and other visual landmarks of the Mac interface in synthesized speech. Because the program can read aloud lines or individual words, users can also use Outspoken to browse and edit text.

According to Sutton, "The Mac is a reading and writing device that lets you keep up with sighted people. It gives access to jobs, information stored in books in libraries, and other electronic formats—online and on CD ROM. For example, you can scan a book with a scan-



When the new school year starts, seven-year-old Megan Rasbold-Gabbard will join other first-graders in class at the Butler School in Belmont, Massachusetts. Because she has cerebral palsy, Megan uses the Mac to communicate with her classmates, like Shannon and Jason here.

"THINK ABOUT IT,"
HE TYPED TO ME
OVER THE NETWORK,
"WITHOUT TELE-
COMMUNICATION,
I COULD NOT SHARE
THESE THOUGHTS
WITH YOU."

ner, then convert it to text with optical character recognition (OCR) software, and print it with a braille printer, like TeleSensory Systems' VersaPoint 40. It does a lot for someone's independence."

He continues, "One reason the Mac is good for visually disabled users is because, thanks to Apple, there are developer standards for Mac software. The File menu is always in the same place. The Edit menu is in the same place. And so on. One of the hardest parts of doing Out-spoken was the nonstandard dialog setups some software developers use."

Robbie Park, a high-school student who has low-vision and physical disabilities, uses Articulate Systems' Voice Navigator, a speech-recognition system. After training the Voice Navigator to recognize his speech, Robbie can tell the Mac to open a file, to type a word, or to dial a telephone number, simply by saying what he wants out loud.

Because of his visual disability, Robbie needs his text enlarged on the screen through CloseView and his text read aloud with Talking

Keys, a public domain desk accessory that uses Macintalk. Once again, HyperCard plays an important role—Robbie uses stacks developed at CAST to organize his hard drive and do his homework.

Hearing disabilities may be a less formidable obstacle to using a Mac than blindness or visual impairment. But a computer can affect a hearing-impaired user in profound ways. Barry Prowell is a senior programmer analyst for Bull HN Worldwide Information Systems and a Vietnam veteran with a nearly total loss of hearing and the use of only one hand.

"My greatest use comes in the area of telecommunications. My Apple II computer is my telephone. I have enough hearing left that when coupled with my speech-reading abilities, I can converse without too many problems. The problem is, if I can't see who I am talking to, I can't hear. Since conversing online is really reading and typing, we have an excellent environment for the hearing impaired."

Prowell operates the AzApple Special Needs BBS in Phoenix. "If someone wants to reach me and they have a computer, it's just a matter of dropping a mailbox message to me. The same applies to America Online. Think about it," he typed to me over the network, "without telecommunication, I could not share these thoughts with you as quickly or easily."

Technology for Learning

Like physical and sensory challenges, learning disabilities continue to affect people throughout their lives—not just while they're in school. For example, a child who can't read (decode) words—although bright and interested enough to learn—can't gain access to the ideas in books. Often, a learning disability causes difficulty in expressing thoughts and ideas in writing. Spelling, grammar, and writing organization can all be affected, so that it's not uncommon for a learning disabled (LD) college student who speaks fluently to write at the eighth- or ninth-grade level.

In schools and colleges across the country, students with learning disabilities are using off-the-shelf Mac software to help overcome their difficulties. Outline processors such as Acta Advantage, for example, can provide an easy and flexible way to organize—and reorganize—thoughts for papers. Writing aids like Deneba's Spelling Coach Professional can help students concentrate less on mechanics and more on expression.

Even basic word processors can make writing easier for anyone who has trouble with more conventional techniques. According to Richard Wanderman, a HyperCard developer and founder of the Forman School's Macintosh



PETER JONES

Not all disabilities are obvious to the eye.
Fourteen-year-old James Nellson uses a Mac to overcome his
difficulties with the mechanics of written
language: spelling, handwriting, and composition.

FINDING RESOURCES

Many disabled people do not know about new technologies that can help them, where to get information about special equipment, or how to pay for it. Information services such as CompuServe, America Online, and GEnie all have dedicated forums or roundtables for discussing disability issues. Many user groups have special-interest groups for users with disabilities. In addition, there are a number of organizations devoted to helping individuals with disabilities gain access to computers.

Founded jointly in 1987 by Apple and the Disabled Children's Computer Group (DCCG) of Berkeley, California, the Alliance for Technology Access (ATA)—formerly called the National Special Education Alliance (NSEA)—is a coalition of independent organizations dedicated to providing disabled individuals access to information and resources on using computers of all types, including Macs.

Each ATA member operates a resource center equipped with a variety

of computers, adaptive devices, and software. There are currently over 40 ATA resource centers around the country.

According to Alan Brightman, manager of Special Education and Rehabilitation at Apple, "Disabled people often have problems with retail establishments. Aside from general access barriers like stairs, there's a high intimidation factor. And of course, typical retailers usually don't carry a wide variety of adaptive devices for people with disabilities to try out."

The goal of ATA centers is not only to help people find an appropriate computer, but also to help individuals adapt that computer to their particular needs. Although each non-profit resource center has its own area of expertise, they share information via AppleLink. That enables a center specializing in the needs of people with visual disabilities, say, to draw on the resources and expertise of another, which may focus on individuals with learning disabilities. See *Where to Buy*

under ATA Centers in the back of this issue for a list of ATA locations and phone numbers.

Another available resource is the Trace Center at the University of Wisconsin-Madison, a leading center for development and evaluation of computers and adaptive devices for people with disabilities (608/262-6966). It offers HyperCard-controlled CD ROM and floppy-based versions of Abledata, a database of all adaptive technology products—from wheelchairs to headmice. In addition, the staff that maintains the Abledata database will search their product database for people who call (800/344-5405, voice or TDD).

Closing the Gap publishes a bi-monthly newspaper about computer technology for people with special needs. One issue each year is a resource directory that lists vendors of hardware and software and organizations for disabled computer users. Write to the group at P.O. Box 68, Henderson, MN 56044 (or call them at 612/248-3294)—**B.M.**

writing lab for LD students, "By separating composition from production, the Mac empowers people who otherwise cannot write. As a dyslexic user myself, I can't begin to tell you the difference the Mac has made."

Jay Brill is the president of the National Network of LD Adults. "My dysgraphia—inability to write—prevents me from writing more than a few words at a time legibly. But with the Mac, I am free to write without worrying about my writing, my spelling, or organization. When I'm through, there are no eraser holes worn through the paper, and every letter looks the same."

HyperCard can be as useful for dyslexic students as it is for those with physical or sensory challenges. Digitized speech can be stored in HyperCard stacks through the MacRecorder from Farallon Computing, enabling poor readers to hear selected text read aloud when they are unsure of a word. HyperCard's Find command can help users with organizational difficulties locate related information easily.

Talking Back

Modern technology has redefined the way people think about disabilities—in fact, in many cases, technology has eliminated the greater

part of the disability itself. But many agree there are still barriers to full independence.

Barry Prowell says, "As for the hardware vendors, I have one question: When are you going to put the damn power switch on the front of the machine? I shouldn't complain, because I can screw in a 3-foot extension to my artificial arm and reach the sucker. And while you're at it, put a master reset button there too."

Steve Magleby adds, "Macs are so much easier for all kinds of disabled people to use. It's unfortunate that Apple has yet to produce the much-rumored low-cost Mac."

Says Liz Vantrease, "A lighter-weight portable Mac would be very helpful. I need to be able to take a computer with voice synthesizer along with me when I go out to see doctors or friends."

David Skinner agrees. "Sarah and I like to travel a lot, and no longer being able to talk adds stress to a task that's not easy at the best of times. Even with a battery pack, the Communi-Mate is not really portable. Right now, if I try to get Sarah's attention in the car, she doesn't know if we took a wrong turn and are headed for Havana or whether I have a sore bum!"

STATUTES OF LIBERTY

Thanks to several federal laws, people with disabilities now have legal rights to challenge discriminatory action and to request services.

Public Law (PL) 94-142, the Education for all Handicapped Children Act, requires school districts to provide accessible technological aids to students with disabilities if those aids will enable those students to be competitive with other students. Federal law mandates that a child of elementary- or secondary-school age with an identified disability have an Individual Educational Plan (IEP). If you feel your child could benefit from computer technology, you must ensure that access to technology is written into the IEP. For example, should a student's disability prevent him or her from speaking or writing, an IEP can call for a computer communication aid that produces synthesized speech, enabling a student to communicate with teachers and classmates. Parents have the right to appeal IEP decisions should parents and school disagree on the potential benefit of computer access. All states have Parent Advocacy Pro-

grams to help parents of children with disabilities.

Section 504 of the Rehabilitation Act of 1973 (PL 99-506) mandates non-discrimination in postsecondary programs. While Section 504 does not require colleges to provide students with individual computers, it does require nondiscriminatory access to any campus computer that is part of the normal college experience. Students denied nondiscriminatory access to computers on campus should file complaints with their campus Section 504-compliance officer or with the U.S. Office for Civil Rights.

PL 100-407, the Technology-Related Assistance for Individuals with Disabilities Act, is designed to help states inform persons with disabilities about the potential impact of technology on their lives, and to provide the mechanisms to put assistive technology into their hands. By May 1990, the U.S. Department of Education had funded 23 states under PL 100-407. For more information, contact state and local government offices about such state programs.

Section 508 of the 1986 Amendments to the Rehabilitation Act of 1973 addresses technology-access rights of disabled individuals in the federal work force. Section 508 requires that all computers in the federal workplace—either out of the box or via adaptive aids—be accessible to persons with disabilities. Private industry and higher education are increasingly using the specific guidelines of Section 508 to define computer access for persons with disabilities.

In what's being called a landmark civil-rights bill, the **Americans with Disabilities Act (ADA)** will extend the equal-access rights of people with disabilities to the private sector, in addition to the federal work force. Covering substantially more than technology access, ADA mandates nondiscrimination in matters including, but not limited to, employment, education, and transportation. ADA has passed in the Senate and the House of Representatives. As of this writing, the bill is in joint committee awaiting reconciliation of the Senate and House versions.—*Jay Brill*

**"THE MAC CAN
GIVE YOU BACK
SOME OF THE
THINGS THAT WERE
STOLEN FROM
YOU BY ILLNESS,
ACCIDENT,
OR BIRTH DEFECT."**

For software developers, André Alm offers some advice. "A disabled person nearly always has problems in physically handling the looking up of information in manuals. I would really like to see them include much more online help in their programs."

Barry Prowell has another comment. "I only have five fingers. I just love those developers who write programs that make you press the Option key, Shift key, and X to do something. Hold the keys down, click the mouse, and drag . . . I only have so many appendages to work with before I get accused of kinky computing."

Richard Wanderman pleads for a better speech-synthesis program than Macintalk, the only software-based speech synthesizer on the Macintosh. Doctors at CAST agree. According to program director Anne Meyer, "An intelligible, inexpensive, text-to-speech system is critical for children with learning and communication disabilities." Digitizing speech with the MacRecorder for playback on the Macintosh—which sounds much more natural than Macintalk—simply takes up too much room on a disk drive.

Independence in 1990

No matter what type of disability is involved, computers in general, and the Macintosh in particular, are significant tools for enhancing users' independence.

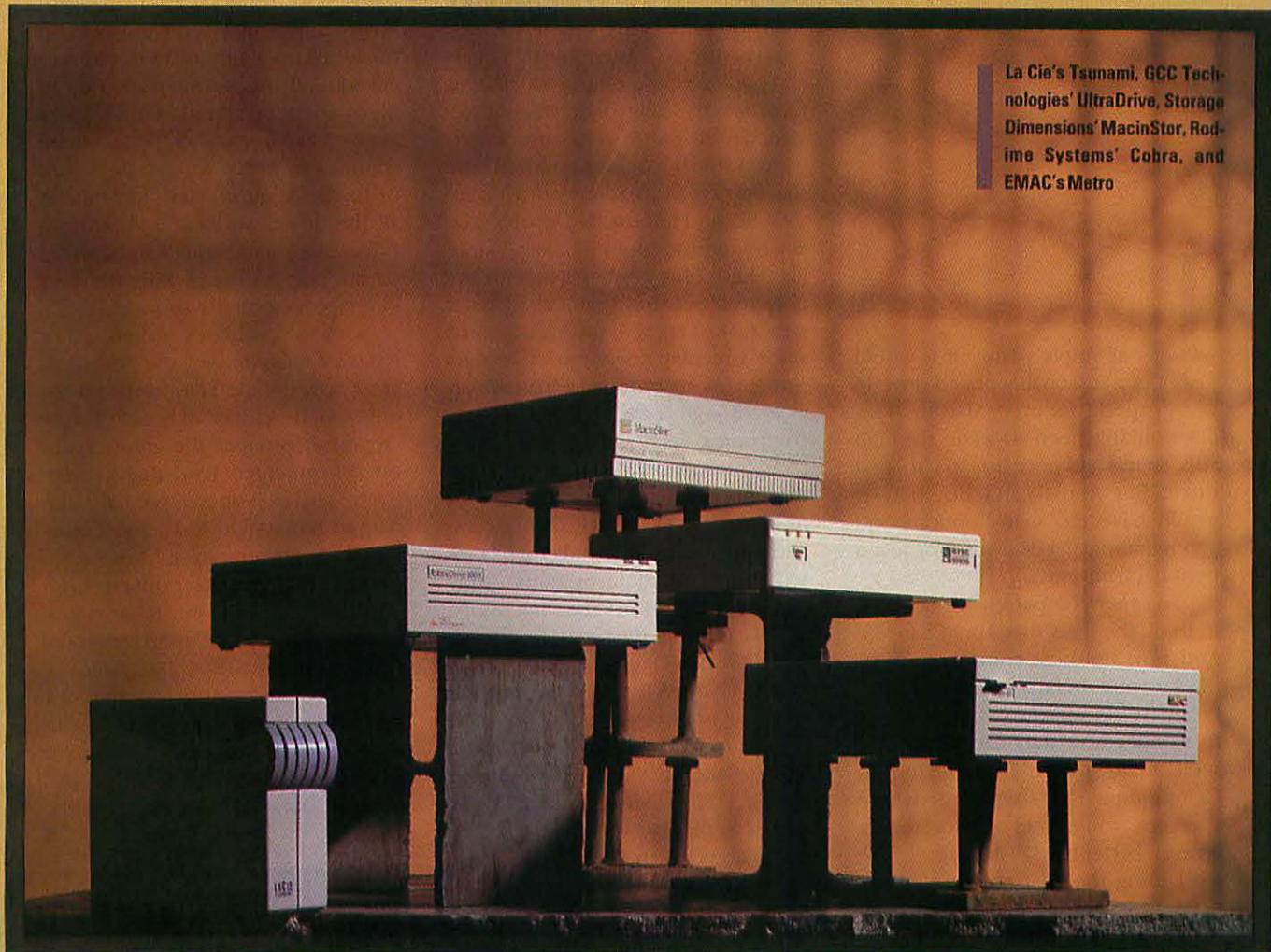
Liz Vantrease says it all when she observes, "The Mac is an empowering device. It can give you back some of the things that were so unfairly stolen from you by illness, accident, or birth defect."

Given the prevalence of physical, sensory, and learning disabilities, the odds are good that you know someone who might benefit from a computer, or that you yourself have a disability that might be well served by one of the Mac's features or products (if so, you may want to contact one of the organizations listed in "Finding Resources"). Greater awareness in the public at large of the computer's capabilities offers the greatest promise of all for fulfilling the potential for independence that can be unlocked by a Mac. ■

See *Where to Buy* for contact information on products and ATA centers.

Best Buys in

La Cie's Tsunami, GCC Technologies' UltraDrive, Storage Dimensions' MacinStor, Rodime Systems' Cobra, and EMAC's Metro



PHOTOGRAPH BY MARK JOHANN

Low - Capacity DRIVES

BY CHERYL
ENGLAND
SPENCER

Believe it or not, some folks don't need a drive larger than 40MB, 50MB, or 60MB. For you non-pack rat types, Macworld Labs reviews 54 low-capacity drives.

It's all Apple's fault. If it would just offer a reasonably priced drive in every capacity for every Mac, then users wouldn't need to wade through spec sheets and price lists to choose a drive. But Apple can't do that—it would have too many options and configurations to deal with for just a peripheral business.

So other companies are flooding in to fill the gaps that Apple has left. And, boy, are those companies creating a torrent. In fact, so many companies have set up shop that you begin to wonder how they can all survive. Well, many won't. Jasmine didn't; Crate didn't. That's why everywhere you turn, you see an ad proclaiming an even better hard disk deal.

During the past year, we've noticed an increasingly loud roar from drive vendors. Gimmicks abound, claims have been made that border on false advertising, and price wars are getting more intense. None of this bodes well for the consumer—not even the price competition. A cheap drive isn't such a great deal if it breaks and the company is no longer around to fix it.

For this article, Macworld Labs tested, poked, and prodded 40MB, 50MB, and 60MB drives from 31 companies. Many of the vendors are long-time players who have sent us quality products in the past, and their drives performed true to form. Other companies—such as Bay Micro Systems, Hard Drives International, and Star Data—are relatively new to the Macintosh hard drive arena; some new entrants fared well against established products, but many didn't.

Following Tradition

Most top-rated drives come from companies that toe a traditional line—

they aren't trying to win market share solely on price or hype. Instead, they consistently pay attention to details and put together quality products. Our favorites typically offer cleanly designed formatting and diagnostic software; a sturdy, platinum-colored case that fits perfectly underneath a Macintosh SE; and informative, professionally bound (not photocopied) manuals. These drives generally aren't the cheapest, but they aren't overpriced either. Most are sold through dealers, since generally speaking, customers can get more prompt, personal service through a local dealer. (Some companies, such as GCC and Microtech International, sell drives both through dealers and direct). Drives from Apple, EMAC, GCC, Maxcess, MicroNet Technology, Microtech International, Rodime Systems, Ruby Systems, PLI, and Storage Dimensions all fall easily into the category of traditional drives. (Of course, a few drives that make our A list don't meet all the above conditions—particularly with respect to case design. For instance, we like the small, fast drives from EMAC, FWB, Liberty, and La Cie as well as SuperMac Technology's larger, vertical Data-Frame XP).

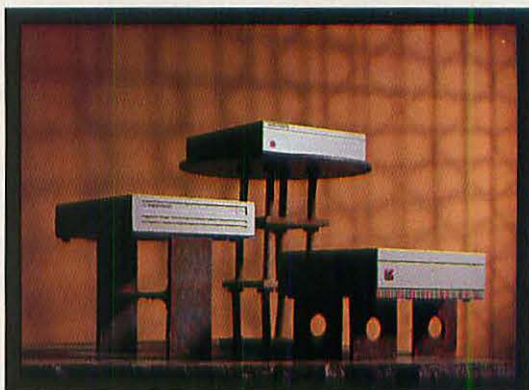
Some of the preferred drives include more than formatting and diagnostic software; partitioning and backup software are especially common. Backup software is handy for any size hard drive. A good program is fast, compresses data, lets you back up to a variety of media, and provides the ability to perform incremental backups—in short, it does all the things Apple's HD Backup doesn't. Our favorite package, Fifth Generation Systems' speedy Fast-Back II, comes bundled with Rodime's Cobra. We also like Centa Systems' Back Track, bundled with Microtech's Nova; SuperMac's DiskFit, bundled with the Data-Frame; PLI's TurboBack, bundled with the PLI 50 Turbo; and, to a lesser degree, Symantec's SUM II, which comes with GCC's UltraDrive.

Partitioning software, which lets you divide a hard disk into volumes of various sizes, is probably unnecessary

for users with drives of less than 80MB. Programmers may want to divvy up the space on a hard drive in order to get around the System's 2000 or so files-per-volume limit. Other users may just like to group files on separate volumes in order to stay organized or to cut down on start-up time. Of all the drives we looked at, Storage Dimensions and SuperMac have the partitioning software with the best interface.

Only a few drives include other types of software, but the best deals are worth noting. PLI includes three utilities it developed in-house: Turbo-Optimizer reclaims the empty space on a fragmented hard disk, Turbo-Cache enables you to store hard disk data in fast system RAM, and Turbo-Spool spools print jobs. Likewise SuperMac includes its popular print spoolers, SuperSpool (for the ImageWriter) and SuperLaserSpool (for laser printers).

Most other hard drive vendors rely on bundling arrangements with software vendors. Especially popular are hard drive utilities such as Symantec's SUM II, bundled with GCC's Ultra-



Microtech International's Nova, Ruby Systems' StarDrive, and MicroNet Technology's Micro/Stack

Drive; Norton Computing's Norton Utilities for Mac, bundled with Microtech's Nova and EMAC's Impact and Metro drives; and Central Point Software's MacTools, bundled with Storage Dimensions' MacinStor. With its E Series and V Series drives, Maxcess includes CE Software's QuicKeys Lite (a macro program that, unlike the standard version of QuicKeys, limits you

MACINTOSH SE RESULTS

Actual result

35.8 Fastest in test
80.5 Slowest in test

Percentage slower than the fastest

0%–10%
10%–20%
20%–30%
30%–40%
40% or more

C = Conner CP3040

CP = Conner CP340

K = Kalok

Q = Quantum

R = Rodime

S = Seagate

W = Western Digital

Some drives that ran fast on a Macintosh II ran slower on a Macintosh SE, and vice versa. For instance, the Seagate-based GCC UltraDrive 45 ran much faster than the Quantum-based UltraDrive 40 on a Macintosh SE. But the Quantum-based UltraDrive 40 was the second-fastest drive overall on a Macintosh II. Macintosh Plus and SE owners should look at the Macintosh SE test results for guidance, while owners of faster Macs should look at the Macintosh II results.

Overall Fastest

		(Seconds) Duplicate 10MB	Load	Save	Search	Compile	(Kilobits per second) Read	Write	Seek*
1.00	FWB PocketHammer 40 (Q)	104.38	135.13	48.97	176.52	1210.50	5022	4346	23
0.99	iDS Prologue 40 (Q)	121.67	124.07	49.31	177.90	1216.44	5319	4378	22
0.99	Cutting Edge XL40 (Q)	121.00	123.06	49.07	175.47	1199.82	5016	4251	22
0.99	Ruby Systems StarDrive 40 (Q)	121.50	122.80	48.78	175.48	1202.04	4996	4226	22
0.99	La Cie ZFP 40 (Q)	120.45	123.39	48.46	176.68	1208.58	5026	4173	22
0.98	Hard Drives Int'l PowerDrive 40 (Q)	126.19	123.75	48.42	176.07	1198.52	4452	4694	24
0.98	Rodime Cobra 70 (R)	119.43	124.58	49.42	172.87	1178.20	4776	3967	20
0.97	Rodime 45 Plus (R)	123.33	122.91	48.60	179.50	1223.43	4742	4198	20
0.97	La Cie Cirrus 40 (C, Q)	124.42	123.39	49.46	176.64	1217.39	4699	4146	24
0.97	Storage Dimensions MacinStor 40 (Q)	125.52	123.63	48.82	174.43	1204.26	4451	4373	22
0.97	Advanced Gravis HardPac 40 (Q)	125.40	123.67	48.71	175.77	1209.90	4448	4391	22
0.97	PCPC MacBottom 42 (Q)	126.75	124.17	48.69	175.75	1202.77	4534	4208	22
0.96	Microtech Nova 40 (Q)	130.15	125.44	48.89	177.48	1210.56	4821	4152	23
0.96	Tallgrass TravelPac 40 (Q)	125.52	124.04	48.21	175.53	1202.92	4297	4210	22
0.96	Heart Data 40 (Q)	126.97	123.69	48.91	175.73	1196.84	4322	4189	22
0.96	Dolphin Integra 40 (Q)	128.06	124.37	48.12	175.78	1203.54	4296	4167	22
0.96	Ehman 40 (Q)	127.38	123.66	49.02	176.18	1197.40	4302	4221	22
0.96	Liberty 40 (Q)	127.95	124.90	48.58	176.38	1201.48	4285	4232	22
0.96	Ruby Systems Dwarf 40 (Q)	127.38	123.69	48.66	175.91	1219.45	4282	4204	22
0.96	EMAC Impact 40 (Q)	127.56	123.87	49.09	176.10	1199.92	4278	4215	22
0.96	MacProducts Magic Enhanced 40 (Q)	127.40	125.50	49.55	181.85	1217.87	4429	4384	22
0.95	Deltaic 40 (Q)	127.20	124.13	49.62	176.87	1208.20	4285	4225	22
0.95	GCC UltraDrive 45 (S)	107.94	125.55	49.54	175.70	1183.89	3987	3678	22
0.95	Mirror 45 (S)	130.50	123.76	49.06	176.35	1209.21	4264	4155	22
0.95	Rodime Cobra 45 (R)	126.76	125.37	50.79	178.88	1240.70	4750	3960	20
0.92	Apple Hard Disk 40SC (Q)	111.66	125.42	49.67	176.63	1234.91	3803	3294	22
0.91	Maxcess E Series 40 (Q)	133.52	125.79	49.50	176.62	1199.15	3682	3619	22
0.91	Bay Micro 40 (Q)	132.55	131.13	52.36	196.02	1275.10	4324	4246	22
0.86	MicroNet Micro/Stack 40 (C)	148.16	124.99	50.34	184.36	1255.35	3434	2890	26
0.85	La Cie ZFP 40 (C)	145.77	125.69	50.72	185.12	1240.36	3279	2933	24
0.83	Dolphin Integra 60 (S)	153.70	133.42	55.29	196.63	1289.34	3491	3457	29
0.83	MicroNet Micro/Stack 62 (S)	153.64	133.49	55.43	196.72	1291.47	3473	3432	28
0.83	Cutting Edge XL60 (S)	153.58	132.64	55.64	196.93	1293.13	3449	3412	27
0.83	Deltaic 40 (K)	150.93	134.29	56.09	196.62	1362.18	3845	3225	33
0.83	CMS Platinum 40 (C)	151.86	125.90	50.93	184.88	1265.39	3195	2442	25
0.83	SuperMac DataFrame XP60 (S)	154.07	134.25	54.88	201.00	1313.06	3464	3429	27
0.83	Ehman 60 (S)	154.38	133.05	55.63	197.07	1296.54	3433	3360	27
0.82	Western Digital Preference 40AP (W)	164.08	139.84	65.03	202.15	1467.72	4197	4013	56
0.81	iDS Pro 40 (C)	157.95	126.96	52.84	189.56	1326.21	3092	2569	25
0.78	GCC UltraDrive 40 (Q)	142.21	136.87	58.31	201.32	1358.30	2777	2776	32
0.77	Hard Drives Int'l PowerDrive 60 (S)	167.88	134.04	57.04	198.27	1305.27	2753	2751	21
0.77	Ruby Systems StarDrive 60 (S)	169.02	133.61	56.59	199.18	1299.86	2695	2692	21
0.77	Hard Drives Int'l PowerDrive 40 (S)	172.04	135.01	57.94	198.26	1333.52	2790	2791	31
0.77	Mirror 45 (Q)	172.63	134.71	57.78	198.45	1334.33	2732	2728	29
0.76	Ehman 45 (S)	174.36	135.70	57.98	199.37	1348.19	2724	2723	31
0.76	Procom 45 (S)	173.94	136.27	58.69	198.12	1353.39	2719	2719	33
0.75	MicroNet Micro/Stack 46 (S)	174.77	135.79	58.49	199.13	1414.20	2691	2691	32
0.75	PLI 50 Turbo (S)	179.54	137.33	58.96	200.75	1373.89	2719	2719	43
0.75	Relax Hard Plus 46 (S)	178.23	137.43	59.05	205.66	1386.37	2785	2781	37
0.74	iDS Pro 50 (S)	178.82	137.78	59.67	204.28	1419.30	2748	2748	44
0.74	MacProducts Magic Enhanced 60 (S)	177.15	135.65	58.45	205.17	1376.15	2074	2778	38
0.69	Heart Data 60 (S)	210.12	137.63	60.17	198.55	1323.92	1861	1859	21
0.68	Hard Drives Int'l PowerDrive 40 (CP)	216.88	138.69	61.52	197.13	1358.80	1877	1885	28

*Seek results are not included with other tests for the overall index.

to 14 keystrokes), DiskTop (a useful file-management program), and Mock-Package (a group of utilities, including a text editor and background printer). The PCPC MacBottom drive comes with a nifty utility that lets you copy a single large file onto a couple of floppy disks and then restore the file on another Mac.

Less Traditional but Still Loved

Not all of the drives we like best take as traditional an approach as the ones listed above. Take the creative design approach adopted by La Cie. The king of consumer choice, La Cie sells three lines of drives—Cirrus, Tsunami, and ZFP (which stands for zero footprint; the unit fits beneath a Macintosh SE). The company's original drive, the Cirrus, has an oddly rounded case that stands vertically beside a Mac (see photo). Nonetheless, the Cirrus has always been a quiet, fast performer. La Cie's latest creation, the Tsunami, looks even odder—wavelike scallops undulate along its bottom edges and a round, purple fan bulges out at the top (see photo). This drive maintains the Cirrus's speed and silence, and some people appreciate its unusual look.

But La Cie hasn't stopped at simply offering three different case designs. Consumers can choose either a Quantum or Conner mechanism when purchasing any 40MB drive. The mechanism you pick determines the length of the warranty (five years for Quantum, one for Conner) and the price you pay (\$50 to \$100 more for a Quantum). Where you purchase your drives may determine which one you get—La Cie sells Cirrus and ZFP drives directly; you must purchase Tsunami drives through dealers.

Even more clever in this age of concern about customer support for hard drives, La Cie offers free on-site service to purchasers of the Tsunami drive. If you have a problem, you call La Cie, which in turn calls TRW, which calls you to set up a time to visit your office. TRW then either replaces or repairs the faulty drive. Although this is really no quicker than getting a company with a guaranteed turnaround time to send you a replacement unit, it does save you the hassle of shipping the drive.

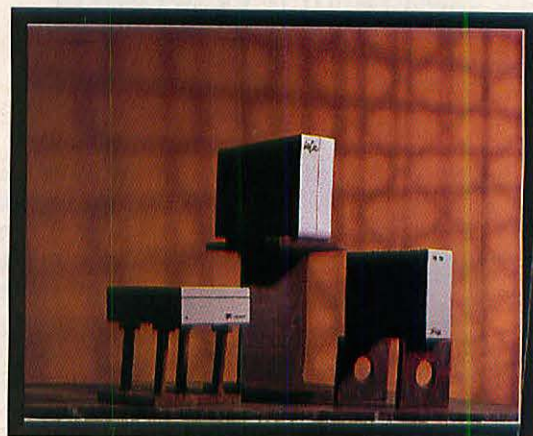
La Cie isn't the only vendor to offer special features or additional choices in order to distinguish itself from the crowd. Some innovations, such as La Cie's longer warranties for the Quantum-based drives, may truly represent a good deal. Others are a bit trickier to evaluate. For instance, EMAC's sturdy Metro drives include SCSI Sentry, a protective circuit that prevents a drive's controller from being damaged due to a short in the SCSI circuitry. Shorts in the SCSI circuitry are infrequent, however. You'd have to do something unusual, like poke a paper clip into the holes of the SCSI connector on the back of a Mac, in order to short out a SCSI circuit. Still, people have been known to do worse things to their Macs, and a little extra protection might not be a bad idea.

Just be careful not to get swept away by features you can't really use. For instance, some companies, such as Mirror and MacProducts, include several megabytes of shareware on their drives. While that may seem like a good deal at first, it's frustrating to plug in a new 40MB drive only to find out that 5MB or more have been filled up with miscellaneous demonstration programs (in other words, advertising), games you don't want, or outdated virus-protection programs.

Small and Mobile

In the June issue we first reported on a new crop of small, lightweight drives that draw their power from the Mac's floppy port (see "Midrange Hard Disks," *Macworld*, June 1990). Because many of the drives had trouble booting from fast Macs such as the IIfx, and because they won't run on a Macintosh II (which doesn't have a floppy port), we hesitated to recommend them to anyone other than Mac Portable users. Over the past few months, however, some companies have solved these problems.

Of the floppy-port-powered drives we tested this time, only Advanced Gravis's HardPac and Tallgrass Technologies' TravelPac failed to boot from a Macintosh IIfx with an internal drive.



iDS's Pro, La Cie's Cirrus, and Liberty Systems' Liberty

The others—the Dolphin Systems Porta, iDS Pro, iDS Wip (an even smaller version of the iDS Pro), Relax Sierra, MacProducts Sierra, MicroNet Technology Micro Pack, and Ruby Systems Dwarf—all worked fine. In answer to our complaint that none of the drives would run on a Macintosh II without adding an external power supply (and thereby negating the size and weight advantages these drives hold), iDS now includes an adapter.

Since these drives have become better behaved, we are more inclined to recommend them, although we still find them best suited to Macintosh Portable users. The MicroNet Micro Pack supports the Portable's sleep mode—when not in use this drive powers down so as to conserve the battery. Our favorite drives without a power supply include the fast iDS Pro, the very tiny iDS Wip, MicroNet's Micro Pack, and Ruby Systems' Dwarf (which includes numerous ventilation holes to prevent heat buildup). Each of these drives is a solid performer and extremely quiet (thanks to the lack of a fan or power supply).

Bargain Hunting

If you're looking for a low, low price per megabyte, a number of companies are glad to oblige. These discounters generally sell direct, but although they offer the basic cables and formatting software you need to get a drive up and running, they offer little in the way of extras. In addition, these companies count on buying mechanisms in bulk from a variety of suppliers in

MACINTOSH II RESULTS

Actual result

35.8 Fastest in test
80.5 Slowest in test

Percentage slower than the fastest

0%–10%
10%–20%
20%–30%
30%–40%
40% or more

C = Conner CP3040

CP = Conner CP340

K = Kalok

Q = Quantum

R = Rodime

S = Seagate

W = Western Digital

In order to determine the overall fastest and slowest drives, we added up the numbers from the real-life tests for each drive and indexed them based on the fastest drive. These indexed numbers are shown in the farthest left-hand column. We then grouped the drives according to how much slower they were overall than the fastest drive. For instance, the drives coded with red are 0 to 10 per cent slower. Actual results for individual tests are also shown and color coded. The drive that ran fastest and the drive that ran slowest in each test are also marked.

Overall Fastest

		(Seconds) Duplicate 10MB	Load	Save	Search	Compile	(Kilobits per second) Read	Write	Seek*
1.00	Rodime Cobra 70 (R)	75.76	45.52	20.52	53.58	480.65	7151	6362	19
0.98	GCC UltraDrive 40 (Q)	70.25	48.04	24.02	50.00	466.46	6430	6438	21
0.97	Rodime Cobra 45 (R)	78.53	46.51	21.53	54.02	504.12	6991	6275	19
0.97	Microtech Nova 40 (Q)	67.05	47.30	22.64	50.74	484.57	5868	5860	22
0.96	Rodime 45 Plus (R)	81.92	45.54	21.09	53.53	494.94	6476	5981	19
0.95	FVB PocketHammer 40 (Q)	74.32	47.06	23.54	50.18	493.24	6029	6026	22
0.95	MacProducts Magic Enhanced 40 (Q)	88.04	47.60	23.39	52.09	487.40	6525	6536	22
0.95	Storage Dimensions MacinStor 40 (Q)	90.66	46.94	23.45	50.22	482.86	6372	6444	21
0.95	Advanced Gravis HardPac 40 (Q)	92.19	47.45	23.34	50.65	492.18	6498	6531	22
0.95	Apple Hard Disk 40SC (Q)	72.27	47.50	24.20	50.77	493.51	5882	5954	21
0.94	iDS Prologue 40 (Q)	90.40	47.88	23.52	50.97	490.15	6450	6475	22
0.94	iDS Pro 40 (C)	88.23	48.75	22.60	59.94	532.25	7240	7053	24
0.94	Hard Drives Int'l PowerDrive 40 (Q)	93.43	47.17	24.00	50.08	496.36	6499	6523	22
0.94	PCPC MacBottom 42 (Q)	88.47	47.13	22.31	50.69	488.08	5970	5962	21
0.93	Heart Data 40 (Q)	91.01	47.20	22.77	50.37	485.90	6059	6046	22
0.93	Ruby Systems StarDrive 40 (Q)	91.05	47.48	23.23	50.07	482.49	5964	5963	22
0.93	EMAC Impact 40 (Q)	91.85	46.85	23.33	50.18	481.66	5971	5957	22
0.93	Maxcess E Series 40 (Q)	92.69	48.23	23.53	50.31	470.94	5981	6011	22
0.93	Liberty 40 (Q)	92.08	47.51	23.47	50.71	480.08	6010	5994	22
0.93	La Cie ZFP 40 (Q)	89.97	46.97	24.00	50.23	488.44	5994	5993	21
0.92	Dolphin Integra 40 (Q)	95.72	47.06	23.31	50.23	491.66	6016	6011	22
0.92	Tailgrass TravelPac 40 (Q)	89.39	47.57	23.57	50.23	500.07	5964	5915	22
0.92	Ruby Systems Dwarf 40 (Q)	92.25	47.56	23.50	50.06	485.04	5906	5846	22
0.92	Cutting Edge XL40 (Q)	91.00	48.10	24.03	50.13	492.20	6002	5991	21
0.92	Mirror 45 (Q)	97.47	47.08	23.70	50.34	489.24	5931	6014	22
0.92	La Cie Cirrus 40 (C, Q)	88.84	48.39	23.39	59.41	543.22	6673	6656	23
0.91	Ehman 40 (Q)	94.60	47.48	24.79	50.35	496.17	5989	5964	22
0.91	Deltaic 40 (Q)	92.61	47.04	23.64	50.39	497.73	5856	5646	21
0.89	MicroNet Micro/Stack 40 (C)	90.62	47.96	23.29	59.41	529.29	6668	5271	25
0.84	CMS Platinum 40 (C)	93.33	48.63	23.82	59.58	541.29	5720	4476	25
0.84	La Cie ZFP 40 (C)	95.08	49.16	24.58	59.54	545.34	5230	5081	25
0.83	MicroNet Micro/Stack 62 (S)	98.85	56.21	28.29	70.77	566.50	6362	6358	29
0.83	Bay Micro 40 (Q)	98.78	54.91	29.83	70.48	551.13	6056	6019	22
0.82	Dolphin Integra 60 (S)	98.39	56.21	28.50	72.61	567.88	6256	6249	28
0.82	Cutting Edge XL60 (S)	96.07	56.57	28.94	72.46	556.15	6107	6049	26
0.82	Ehman 60 (S)	98.28	55.93	28.23	72.84	569.64	6099	6024	26
0.76	Hard Drives Int'l PowerDrive 60 (S)	105.85	56.35	29.04	73.17	571.25	4980	4968	21
0.76	Ruby Systems StarDrive 60 (S)	106.01	56.20	28.38	73.32	551.56	4796	4785	21
0.75	Heart Data 60 (S)	107.09	56.51	28.89	73.22	553.81	4696	4681	21
0.74	GCC UltraDrive 45 (S)	92.61	58.73	34.38	75.81	606.58	5086	5088	34
0.74	Mirror 45 (S)	112.58	57.46	30.63	73.41	598.02	4912	4908	31
0.74	PLI 50 Turbo (S)	111.53	58.43	31.14	73.26	599.76	4905	4910	32
0.73	Procom 45 (S)	112.85	58.39	30.68	73.16	602.42	4867	4866	33
0.73	Deltaic 40 (K)	109.61	59.20	32.24	71.53	630.84	5354	4438	32
0.73	Hard Drives Int'l PowerDrive 40 (S)	112.70	57.99	34.31	73.73	604.46	5099	5099	34
0.72	Ehman 45 (S)	113.07	58.57	32.06	74.51	606.97	4890	4889	31
0.72	MacProducts Magic Enhanced 60 (S)	112.59	58.11	31.29	75.30	600.82	4853	4600	38
0.72	MicroNet Micro/Stack 46 (S)	114.19	58.55	32.57	75.02	607.26	4796	4797	33
0.72	Relax Hard Plus 46 (S)	118.17	58.64	34.62	75.47	615.07	5107	5088	36
0.72	Hard Drives Int'l PowerDrive 40 (CP)	118.65	58.52	30.93	72.54	584.63	4369	4540	27
0.71	iDS Pro 50 (S)	113.86	59.14	34.95	77.11	636.04	4998	4990	41
0.67	SuperMac DataFrame XP60 (S)	127.84	58.48	31.30	74.72	583.83	3506	3510	27
0.64	Western Digital Preference 40 (W)	137.61	66.30	38.51	77.76	743.45	4459	4427	56

*Seek results are not included with other tests for the overall index.

A CONSUMER'S GUIDE TO LOW-CAPACITY DRIVES

	Product	40MB Drives ¹	45MB-50MB Drives ¹ (capacity/mechanism/price)	60MB-70MB Drives ¹	Internal Versions	Method of Sale	Takes Power from Floppy Port	Dimensions (h x w x d, in inches)	Case Material
Advanced Gravis	HardPac	40/Q/\$995			no	via dealer	yes	2 x 4 x 7.2	plastic
Apple Computer	Hard Disk 40SC	40/Q/\$1299, 40/S/\$1299			yes	via dealer	no	3.1 x 9.7 x 10.5	plastic
Bay Micro Systems	Bay Micro	40/Q/\$525			yes ²	direct	no	3 x 9.5 x 9.75	plastic
CMS	Platinum	40/C/\$919			yes	via dealer	no	2 x 9.8 x 10.5	metal
Cutting Edge	XL	40/Q/\$849	45/S/\$749	60/S/\$799	yes	via dealer	no	2.3 x 9.75 x 9.8	metal
Deltaic Systems	Deltaic	40/K/\$699, 40/Q/\$799			yes ²	direct/dealer	no	2.3 x 9.7 x 9.7	metal or plastic
Dolphin Systems	Integra	40/Q/\$838	47/S/\$820	60/S/\$1011	yes	via dealer	no	2.5 x 13 x 14.5	metal
	Porta	40/C/\$881			yes	via dealer	yes	2 x 4 x 7	metal
Ehman	Ehman	40/Q/\$459	45/S/\$399	60/S/\$499	yes	direct	no	2.3 x 9.75 x 9.8	metal
EMAC	Impact	40/Q/\$829			yes	via dealer ³	no	2.5 x 6 x 10.5	plastic
	Metro	40/Q/\$849			yes	via dealer ³	no	2.8 x 9.7 x 10.7	plastic
FWB	PocketHammer	40/Q/\$950			yes ³	via dealer	no	6.5 x 3 x 9	metal
GCC Technologies	UltraDrive	40/Q/\$799	45/S/\$699		yes ³	direct/dealer	no	2.75 x 9.5 x 10.75	plastic
Hard Drives International	PowerDrive	40/S/\$399, 40/CP/\$429		60/S/\$449	yes	direct	no	2.5 x 3.75 x 9.75	metal
		40/Q/\$459							
Heart Data Corporation	Heart Data	40/Q/\$769		60/S/\$899	yes	direct/dealer	no	3 x 9.5 x 11	metal
iDS	Prologue	40/Q/\$835, 40/C/\$835	50/S/\$835		yes	via dealer	no	3 x 10 x 11	metal
	Pro	40/Q/\$725, 40/C/\$725	50/S/\$725		yes	via dealer	yes	2 x 4.7 x 7.9	plastic
	Wip	40/C/\$725			yes	via dealer	yes	1.3 x 4.7 x 7.9	plastic
La Cie	Cirrus	40/C/\$529, 40/Q/\$579	50/Q/\$659		no	direct	no	6.5 x 2.5 x 9	plastic
	Tsunami	40/C/\$699, 40/Q/\$799	50/Q/\$899		no	via dealer	no	2 x 6 x 8	plastic
	ZFP	40/C/\$479, 40/Q/\$529	50/Q/\$599		no	direct	no	3.5 x 10 x 10.5	plastic
Liberty Systems	Liberty 40	40/Q/\$699			no	direct	no	2 x 5 x 7	metal
MacProducts	Basic Series	40/C/\$429, 40/Q/\$429	46/S/\$409, 50/Q/\$479	60/S/\$549	yes	direct/dealer	no	2.25 x 9.5 x 9.5	metal
	Magic Enhanced	40/C/\$479, 40/Q/\$479	46/S/\$459, 50/Q/\$529	60/S/\$599	no	direct/dealer	no	2.25 x 9.5 x 10.5	metal
	Sierra	40/C/\$479, 40/Q/\$479	46/S/\$459, 50/Q/\$529		no	direct/dealer	yes	5.25 x 2.5 x 7.75	metal
Maxcess	E Series	40/Q/\$995			yes	via dealer	no	2.4 x 9.5 x 9.75	metal
	V Series	40/Q/\$995			yes	via dealer	no	6.5 x 3 x 8.25	metal
MicroNet Technology	Collegiate Pack	40/C/\$749				via dealer	no	2.25 x 6.25 x 7.75	metal
	Micro Pack	40/C/\$725	46/S/\$649		yes ²	via dealer	yes	2 x 5 x 9.25	metal
	Micro/Stack	40/C/\$925	46/S/\$849	62/S/\$989	yes	via dealer	no	3.13 x 10 x 10.38	metal
Microtech International	Nova	40/Q/\$649			yes	direct/dealer	no	2.5 x 9.7 x 10.5	plastic
Mirror Technologies	Mirror		45/S/\$497	60/S/\$627	yes	direct	no	2.5 x 9.7 x 10.85	metal
PCPC	MacBottom	42/C/\$579			yes	direct/dealer	no	2 x 9.7 x 9.5	plastic
		42/Q/\$579							
PLI	PLI 50 Turbo		50/S/\$799		yes	via dealer	no	2.4 x 9.8 x 9.8	plastic
Procom Technology	Procom		45/S/\$845		yes	via dealer	no	2.25 x 9.7 x 10.25	plastic
Relax Technology	Hard Plus		46/S/\$699		yes ²	via dealer	no	2.6 x 10.2 x 10.8	metal
	Sierra		46/S/\$619		yes ²	via dealer	yes	5.5 x 2.2 x 7.5	metal
Rodime Systems	45 Plus		45/R/\$1299		yes	via dealer	no	2.9 x 9.7 x 10.4	plastic
	Cobra		45/R/\$1399	70/R/\$1599	yes	via dealer	no	2.5 x 9.7 x 10.4	plastic ⁷
Ruby Systems	Dwarf	40/Q/\$875	45/S/\$759	60/S/\$899	yes	via dealer	yes	2.25 x 7 x 4.25	plastic
	StarDrive	40/Q/\$925	45/S/\$799	60/S/\$939	yes	via dealer	no	2.5 x 10 x 10.5	plastic
Storage Dimensions	MacinStor	40/Q/\$1269			yes ³	via dealer	no	3 x 9.7 x 15	plastic
SuperMac Technology	DataFrame XP			60/S/\$1199	no	via dealer	no	8 x 3 x 9.5	metal
Tallgrass Technologies	TravelPac	40/Q/\$1195			no	via dealer	yes	2 x 4.6 x 7.2	plastic
Western Digital	Preference 40AP	40/W/\$999			no	via dealer	no	3.1 x 6.8 x 8.1	plastic

¹ C = Conner CP3040, CP = Conner CP340, K = Kalok, Q = Quantum, R = Rodime, S = Seagate, W = Western Digital. ² This service is provided by dealers. ³ No internal version for the Macintosh Plus. ⁴ Depends on the mechanism. ⁵ Direct to educational institutions. ⁶ Two years if you purchase a carrying case. ⁷ Case includes power switches on front for controlling other peripherals and the Macintosh CPU. ⁸ With extended warranty.

Type of Termination	Partitioning Software	Backup Software	Password-Protection Software	Other Commercial Software	Warranty (in years)	Extended Warranty Available	Toll-free Telephone Support	Guaranteed Turnaround Time	Data Recovery upon Request	User Specifies Mechanism
internal	yes	no	yes	no	1	no	yes	2 weeks	yes	yes
external	yes	HD Backup	no	no	1	yes	no	none	no ²	no
internal	no	HD Backup	no	no	2	yes	no	72 hours ²	yes	yes
internal	no	no	no	no	1	yes	no	none	yes	no
internal	no	DS Backup	no	MacTree Plus	1	no	no	none	yes	no
external	no	no	no	no	1	yes	no	none	yes	yes
internal	yes	HD Backup	no	no	1-2 years ⁴	yes	no	48 hours ²	yes	yes
internal	yes	HD Backup	no	no	1	yes	no	48 hours ²	yes	yes
internal	no	DS Backup	no	MacTree Plus	1	no	no	none	yes	no
external	yes	HD Backup	yes	Norton Utilities for Mac	2	no	no	5 days	yes	no
external	yes	HD Backup	yes	Norton Utilities for Mac	2	no	no	5 days	yes	no
internal	yes	HD Backup	yes	Hard Disk Deadbolt, Hard Disk Utilities	1	yes	no	48 hours	yes	no
external	yes	SUM II	yes	Quick Spool II	2	yes ²	yes	none	yes	yes
internal	yes	no	yes	no	1	no	no	48 hours	no	yes
internal	yes	no	no	no	2	yes	yes	2 days	yes	yes
internal	no	HD Backup	yes	PackIt III	2-5 ⁴	no	yes	24 hours	yes	yes
internal	no	HD Backup	yes	PackIt III	2-5 ⁴	no	yes	24 hours	yes	yes
internal	no	HD Backup	yes	PackIt III	2-5 ⁴	no	yes	24 hours	yes	yes
internal	yes	HD Backup	yes	no	1-5 ⁴	no	yes	72 hours	yes	yes
switchable	yes	HD Backup	yes	no	1-5 ⁴	no	yes	72 hours	yes	yes
internal	yes	HD Backup	yes	no	1-5 ⁴	no	yes	72 hours	yes	yes
internal	FileLock	HD Backup	yes	no	1 ⁶	no	no	48 hours	yes	no
internal	no	HD Backup	no	SmartCache	1-2 ⁴	yes	no	none	yes	yes
internal	no	HD Backup	no	SmartCache	1-2 ⁴	yes	no	none	yes	yes
internal	no	HD Backup	no	SmartCache	1-2 ⁴	yes	no	none	yes	yes
internal	yes	no	yes	QuickKeys Lite, DiskTop, MockPackage	2	no	yes	24 hours	yes	yes
internal	yes	no	yes	QuickKeys Lite, DiskTop, MockPackage	2	no	yes	24 hours	yes	yes
internal	yes	no	yes	no	1	yes	no	48 hours	yes	yes
internal	yes	no	yes	no	1	yes	no	48 hours	yes	yes
internal	yes	no	yes	no	1	yes	no	48 hours	yes	yes
internal	yes	Back Track	no	Norton Utilities for Mac	5	no	yes	24 hours	yes	yes
internal	yes	Volume Back	no	no	2	yes	no	5 days ⁶	yes	yes
internal	no	no	no	SCSI Floppy	2	yes	no	48 hours ⁶	yes	no
internal	yes	TurboBack	no	TurboCache, TurboSpool, TurboOptimizer	1	yes	yes	48 hours ²	yes	yes
switchable	yes	no	yes	no	1	no	no	24 hours ²	yes	no
external	yes	Relax & Save	yes	no	1	no	yes	none	yes	yes
external	yes	Relax & Save	yes	no	1	no	yes	none	yes	yes
internal	yes	no	yes	no	1	no	no	72 hours	no	yes
internal	yes	FastBack II	yes	no	1	no	no	72 hours	no	yes
internal	yes	no	yes	no	1	yes	yes	48 hours	yes	yes
internal	yes	no	yes	no	1	yes	yes	48 hours	yes	yes
external	yes	MacTools	yes	MacTools	2	no	no	24 hours	yes	yes
internal	yes	DiskFit	yes	SuperSpool, SuperLaserSpool	1	no	no	72 hours	no	no
internal	yes	no	yes	Disk Tools Plus	2	yes	yes	24 hours	no	yes
internal	no	no	no	no	1	no	yes	48 hours	yes	no

order to keep their price to the consumer down. Thus, month to month, the mechanisms they have available may come from different makers.

Of the discounters, Ehman and Hard Drives International provide the best products, although the quality can still be spotty. For instance, if you read our hard drive roundup in the June issue, you'll know that the Ehman drives caused us no end of problems, while the Hard Drives International PowerDrive worked fine. This time around, all of Ehman's drives were average performers but the Conner CP340-based PowerDrive was unacceptably slow.

The CP340-based PowerDrive also required some work to format. When attached to a Macintosh SE, the drive should have run fastest at a 2:1 inter-

leave ratio. Instead, we recorded faster times when the drive was formatted at a 3:1 ratio—the ratio that is normally more appropriate for a Mac Plus.

Both Ehman and Hard Drives International are working to improve the quality of their products and their support. For instance, Ehman has cleaned up its formatting software and has hired more customer service representatives. We'll continue to follow these companies to see if the changes work. Two other companies, MacProducts and Relax, could also be considered discounters since their prices are generally low. Relax, however, sells through dealers only, while MacProducts sells both through dealers and direct. In "Midrange Hard Disks" we reported problems copying files and folders on Relax and MacProducts

drives, a problems we attributed to Relax's driver software (which MacProducts licenses). Out of interest, we double-checked some of the 80MB drives we had originally tested. Neither these nor any of the 40MB to 60MB drives we tested this time had difficulty copying files. Whatever the initial problem was—whether driver related or mechanism related—it seems to have been fixed.

Other discounters didn't do well either in our benchmark tests or in our subjective review. We wouldn't touch Star Data's StarMac with a ten-foot SCSI cable, much less attach it to our Macs. The problems started immediately after we formatted the drive. The StarMac wouldn't mount. We had to restart the Mac every time in order to get the drive to show up on the

DO-IT-YOURSELF TERMINATION

Nearly every time we publish a review of hard drives, we complain about drives with internal termination. Apple requires that the first and last peripherals attached to a Mac's SCSI port be terminated—echoes from electronic signals passed through the cable must be deadened. Since many hard drive compa-



nies bank on the fact that a hard drive will be the first (and only) peripheral in a chain, they add termination. For a first-time Mac user, this makes a hard drive a plug-and-play proposition.

But for anybody with a couple of other SCSI peripherals attached, dealing with termination can be a nightmare. If you've

already got, say, an internal drive (which is terminated) and an internally terminated tape backup drive hanging off the SCSI port, and you want to add a hard drive that a vendor has so kindly terminated for you, here's what to do.

First of all, check out what type of termination the drive has. If the drive comes with a small 50-pin adapter, then you're lucky—you've picked a drive that is externally terminated. Otherwise you'll need to remove the internal terminators.

You'll need to know what you are looking for. Internal terminators look like tiny pieces of plastic with little metal legs sticking out. You see only the plastic tops; the legs are firmly secured inside the drive.



Most drives don't allow easy access to terminators; you need to open the drive's case with a small Phillips screwdriver. Some

cases, such as those with Ehman drives, have a piece of clear plastic that lets you see the terminators. Removing the plastic allows easy access to the terminators.

Once the case is open, you need a pair of pliers to remove the terminators. If you ever played the game of Operation as a child, you know what this procedure feels like. Grasp the terminators firmly with the pliers and pull them straight out, gently. I never was very good at Operation, and I usually end up bending the pins on at least one of the terminators. That won't hurt the drive, but you'll never be able to reinsert a bent terminator.

That's it. Close up the drive's case and you're done. If you ever need to terminate the drive, you'll have to put the terminators back in (assuming you are more skilled at removing them than I am). An external terminator won't work because internal and external terminators have different SCSI power requirements.

desktop, and we never did get the drive to work as a start-up disk. When we finally got the StarMac mounted, it said we had used 29,472K on the disk with 0 files. Only by erasing the drive from the File menu could we get a correct reading. To top things off, the StarMac uses the same Conner CP340 mechanism that the problem PowerDrive does and, as a result, had the same formatting and speed problems. True to form, however, the StarMac's software wouldn't let us change the drive's interleave ratio.

For the real kicker, we could never reach Star Data after our initial product order (the telephone number had been disconnected). The point here is that you should be cautious when it comes to bargain hunting. If the lowest price per megabyte is your main criterion, pick a product from a more widely known company such as Ehman or Hard Drives International. At least you know that the drive comes with all the cables and software you need to get started. Some no-name discounters may try to cut corners by omitting SCSI and power cables. In addition, both Ehman and Hard Drives International are trying to provide quality products at a low price, although they have not yet reached the level of consistency of companies that put attention to detail over price per megabyte. If you want to try a product that this article doesn't review, try asking online-service users for their recommendations. Future articles on hard drives in *Macworld* will review products from companies such as Third Wave and Alliance Peripheral Systems that have been getting good notice on some of these services.

Recommendations

As always, there's a smattering of drives we would avoid, a few that we like best, and a whole slew that fall somewhere in between. We didn't have much luck with the slow, problem-plagued Conner CP340-based Hard Drives International PowerDrive. Don't get this mechanism confused with the Conner CP3040, however. The extra 0 in the number scheme makes a big difference—CP3040-based drives were winners, fast and quiet.

Other drives to avoid include the slow, feature-poor Western Digital

Preference 40AP and the noisy Dolphin Integra 60 (the other Dolphin drives didn't jangle our nerves at all, however). A newcomer, Deltaic's 40MB drive with a Kalok mechanism, was noisy when seeking data and wouldn't always work as a start-up disk. (Deltaic's 40MB drive with a Quantum mechanism worked just fine, however.) Drives with a Seagate mechanism are also not highly favored. They are a bit cheaper than Quantum and Conner mechanisms, and they do give you a couple of extra megabytes of drive space, but they tend to be slower and noisier.

In spite of our complaints, we found several drives that we really liked—and, not surprisingly, we've picked many of these drives as winners before. GCC's fast UltraDrives are top on the list with a sleek case; excellent, clear manuals; and the inclusion of SUM II. Storage Dimensions' MacinStor drives are consistently reliable, with clean formatting software and the MacTools hard drive utility. We also liked the well-designed, reliable MicroNet drives and the speedy Rodime Cobra. The slender Cobra has some nice touches, such as an on-screen, simulated LED indicator. Both the EMAC Metro and Microtech Nova drives include Norton Utilities for Mac, the easiest to use of all the hard drive-utility packages. The Nova drive also includes nice backup software, while the Metro drive has a handy power switch on the front of the case. And yes, we still love the funky, fast La Cie Cirrus and Tsunami drives. Their silence is a big plus, as are their low prices and wide variety of mechanism and warranty options. For users looking for portability, we recommend the small, fast, lightweight Liberty drives.

Numerous other drives walk the middle line between being top picks and being not recommended. There is nothing wrong with these drives, it's just that there are so many products to choose from that even a couple of nice touches can move a drive from being a fine, solid product into being a top-rated drive. Perhaps the competition will give consumers ever better products from which to choose. ■

See *Where to Buy* under Hard Disks for contact information.

NOISE

Color coding indicates the number of times louder each drive is than the quietest drive. For every 3-decibel increase, humans perceive sound to be twice as loud.

	1-2 times
	2-3 times
	3-4 times
	4-5 times
	5-6 times
iDS Pro 40 (C)	34.8
Deltaic 40 (Q)	36.7
Liberty 40 (Q)	37.2
Heart Data 60 (S)	37.4
Heart Data 40 (Q)	38.1
Ehman 40 (Q)	38.2
GCC UltraDrive 45 (S)	38.6
Advanced Gravis HardPac 40 (Q)	38.9
Tallgrass TravelPac 40 (Q)	38.9
GCC UltraDrive 40 (Q)	39.9
Cutting Edge XL40 (Q)	40.4
iDS Pro 50 (S)	40.5
Mirror 45 (Q)	40.7
Rodime Cobra 45 (R)	40.8
FWB PocketHammer 40 (Q)	40.8
Maxcess E Series 40 (Q)	40.8
Mirror 45 (S)	40.9
Procom 45 (S)	40.9
SuperMac DataFrame XP60 (S)	40.9
La Cie ZFP 40 (C)	41.0
iDS Prologue 40 (Q)	41.1
EMAC Impact 40 (Q)	41.1
CMS Platinum 40 (C)	41.1
MicroNet Micro/Stack 62 (S)	41.1
Microtech Nova 40 (Q)	41.2
Storage Dimensions MacinStor 40 (Q)	41.4
Ruby Systems Dwarf 40 (Q)	41.5
Ruby Systems StarDrive 60 (S)	41.6
MacProducts Magic Enhanced 40 (Q)	41.9
Apple Hard Disk 40SC (Q)	42.3
MicroNet Micro/Stack 40 (C)	42.4
Ehman 45 (S)	42.4
Hard Drives Int'l PowerDrive 40 (CP)	42.5
Western Digital Preference 40 (W)	42.5
La Cie ZFP 40 (Q)	42.6
Rodime Cobra 70 (R)	42.7
Cutting Edge XL60 (S)	42.7
Ehman 60 (S)	42.9
MacProducts Magic Enhanced 60 (S)	42.9
MicroNet Micro/Stack 46 (S)	43.4
Dolphin Integra 40 (Q)	43.5
Bay Micro 40 (Q)	43.9
Relax Hard Plus 46 (S)	44.1
Ruby Systems StarDrive 40 (Q)	44.2
Hard Drives Int'l PowerDrive 60 (S)	44.3
PCPC MacBottom 42 (Q)	44.9
Hard Drives Int'l PowerDrive 40 (Q)	46.1
Hard Drives Int'l PowerDrive 40 (S)	46.8
PLI 50 Turbo (S)	48.8
Rodime 45 Plus (R)	49.7
Dolphin Integra 60 (S)	53.9

The key to the letters in parenthesis is with the speed results

LIFE

ONLINE

Wherein our man of the moment tries to live by a modem alone

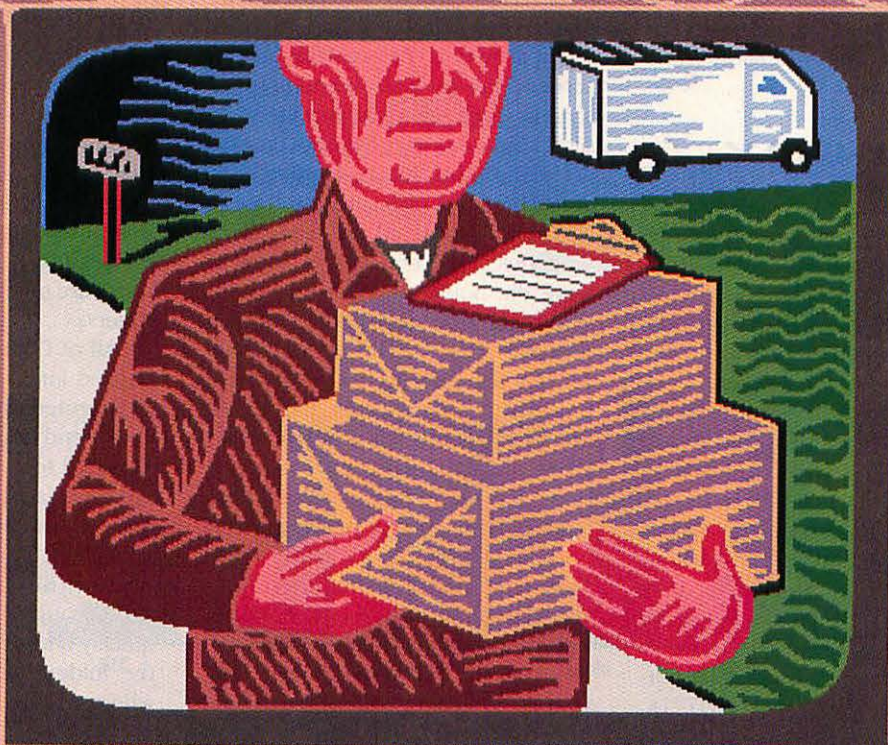
The ads are enough to make the average efficiency-monger's mouth water. "Join the Information Age," they beckon. "Use your Macintosh to connect with the real world. Correspond, fax, buy, sell, meet, bank, and shop—without stirring from your ergonomic desk chair!"

The products advertised are, of course, online information services. Anyone with a Mac and a modem can dial one up, usually paying by the hour, and connect to a distant roomful of mainframe computers—and thereby to a national network of other users. Such services now number in the dozens, each billing itself as the computer owner's ideal link to a world of information and services.

Having been sufficiently enticed by such ads, I made up my mind to greet the challenge of online services with an open mind (and a valid credit card). As a matter of fact, I decided it wasn't enough just to meander hopelessly through computerized jungles; if I was to emerge from this experience a better man, I would have to truly master my craft. Therefore, I vowed to try the Information Age on for size: I'd attempt to live for an entire week without leaving the apartment. Yes, I would shop, correspond, conduct business, and even socialize, with a modem as my sole link to the outside world.

I armed myself with a 4-foot stack of manuals, promotional materials, and directories provided by the seven general-purpose networks I'd joined: CompuServe,

BY DAVID POGUE



fee for unlimited usage. This system—which BIX regulars love—causes one unfortunate side effect, however. At peak times, you may get an “all ports busy” message instead of a connection. And when you do reach the service, it may be frustratingly sluggish.

BIX Fix

Despite its technical reputation, BIX isn't intimidating. A numbered list of possible commands appears at every juncture; you type the appropriate number and press Return. BIX offers the usual slew of services—E-mail, downloadable software, BBS areas—but I went straight to the Macintosh Questions area.

What I found there amazed me: hundreds of well-informed, articulate answers to all kinds of Macintosh questions that had been posted by BIX members. Examples: “Why is my new mouse's ball black instead of white?” (The black ones are the newer Taiwanese-made mice.) “Why do they say MultiFinder isn't true multi-tasking?” (It is much closer to multi-tasking than it's given credit for.) I added a question about my double-clicking dilemma to the pile, making

a mental note to check for responses the next day.

When I returned to BIX, I didn't find one answer to my question—I found many. The respondents all agreed that my double-clicking problem wasn't unusual and that the trouble lay with the contacts inside the mouse. One fellow even uploaded an illustrated 5-page set of instructions for repairing the mouse. I learned more about the clicking process than I'd ever wanted to know, but along the way, I found the solution to my problem and made a few friends.

WEDNESDAY

The friends I was making online were telling me that Apple had released System 6.0.5. Fortunately, almost every online service is a treasure trove of publicly distributable Mac software. And no service (except Connect) charges you extra for downloading the software.

I tried GENie first. Like BIX, GENie is a text-based service, but it's much larger and has a less technical bent. There's a lot of creativity evident in GENie's upbeat, personal atmosphere.

There's an interactive game called Imagine Nation; the BBS areas are called roundtables; and there are plenty of useful services: the OAG airline ticketing system, a direct link to a discount stock brokerage, and several shopping systems. And GENie's menu system is friendlier than those of most text-based systems; each numbered menu offers Help and an exit to the previous menu.

Still, GENie is a complicated network. You only begin to appreciate it—or any text-based service—after spending several intense evenings online. During my first online session, I struggled in vain to figure out how to read just the messages I wanted to see. Only after ordering the manual and asking questions of people online—who were, as online users usually are, witty and willing to help—did I begin to tap GENie's vast potential. For instance, a novice has to plod, menu after menu, toward a particular service or BBS topic. The experienced GENie user, however, has learned that feature's *page number*, and can jump directly to that page. (And if you're really experienced, you'll uncover a feature no other text-based service offers: real-time games you can play against other users, during which your screen shows video game-style graphics instead of text.)

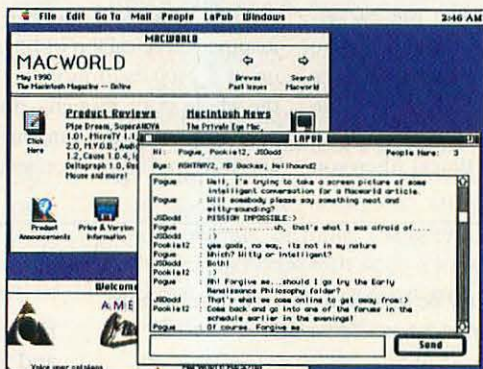
Whether because System 6.0.5 had not been posted on GENie yet or because I still hadn't figured out GENie's file-finding system, I could not locate System 6.0.5 in GENie's software libraries. So I rolled up my sleeves and decided to hook up with CompuServe, the granddaddy of the online networks.

THURSDAY

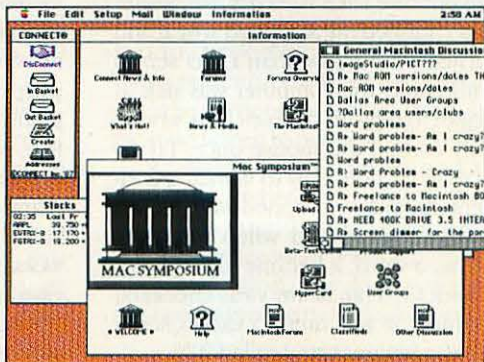
CompuServe is everything its reputation claims: vast, confusing, well established, well connected to other services, and expensive. With 14,000 features and services, it could easily be the subject of an article—even an encyclopedia—unto itself. And, like GENie, CompuServe is a text-based service with numerous menus and numerous shortcuts.

In my quest for System 6.0.5, I proceeded through several menus. First I chose Computers/Technology;

Macworld Online America Online offers you the chance to be in more than one place at a time. In the foreground, a meaningful discussion is taking place in real time; in the upper left, you can see the opening screen of Macworld's online edition.



Connect Direct The graphic interface of Connect is much simpler to navigate than that of text-based services. Here you can see the automatically updating stock ticker (lower left), the Mac Symposium opening screen, a list of BBS messages (the active window), Connect's main Information screen, and a control panel for disconnecting or sending E-mail.



sure enough, one of the choices on the next menu was Software Forums. I was certain I'd arrived. But after muddling around awhile, I discovered that to find Mac software, I'd have to go to a Hardware forum and from there to a Mac forum.

One of the choices in the Mac forum, File Finder, sounded good to me. I told it to search for System 6.0.5. After a moment, CompuServe told me, "No files located." But when I searched for System, CompuServe found 234 files. I tried to narrow the search by date (only files posted within the last month), but this time CompuServe told me, "No files located." After a few more fruitless searches, I gave up.

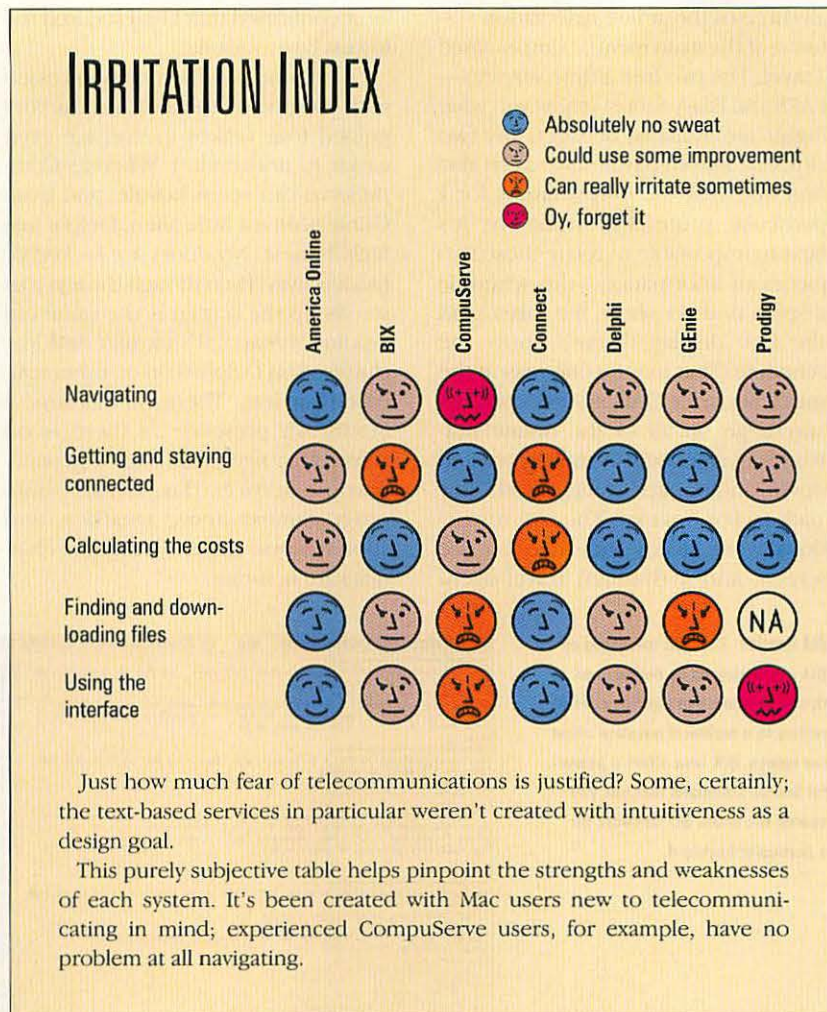
By now I was lost. In fact, I could find no way to escape the File Finder, and the CompuServe meter was running. I typed HELP, and the ensuing screenful of information told me that I could return to the main menu by typing TOP. To make a much longer story short, I spent over an hour meandering around the CompuServe universe before I found System 6.0.5 in a forum called Macdev.

Help on the Way

That not-so-unusual anecdote demonstrates that CompuServe simply isn't an informational cafeteria, where you can see what you want and take it. It's a maze of dungeons, each stocked with treasure, but impossible to navigate with no map and no experience.

If you decide to undertake the quest, buy *How to Get the Most out of CompuServe* (Bantam Books, 1989) from CompuServe. Working through this book is a project in itself, but the well-explained navigational tips could save you plenty of time (that is, money) online. You might also try a program called Navigator 3.0 that automates getting mail, messages, and files from CompuServe, saving you plenty of money and expensive meandering. Navigator won't, however, let you make plane reservations, shop, chat with other users, do research, or—most important of all—explore.

CompuServe's administrators are working to address some of the system's problems. They hope to soon finish the Information Manager, a graphic interface that's designed to make the service less daunting for Mac



users. CompuServe is currently the most complete, most well-stocked service in the country, but it's also the most intimidating. Therefore, if this new interface lives up to its previews by making all that information easier to access, it will make CompuServe exceptionally useful. You'll still pay through the nose, but—in theory at least—you'll spend less time online.

FRIDAY

It's almost a personal-computing cliché by now: I can make plane reservations right on my computer! Long intrigued by the specifics—and bored silly after a week in my apartment—I decided that it was time to escape. I began planning a trip to the West Coast.

Most of the services provide gateways to one of the three major airline-ticketing systems: the Online Airlines Guide, American Airline's Easysabre,

or the PARS Travel network. Delphi offers all three.

The Oracle

Of all the text-based services, Delphi is the most natural to use. Menus always offer you the chance to back-track or to read context-appropriate help. And menu commands aren't numbered, as they are on other services; you just type the first few letters of the command you want. This system involves more typing on your part—but using plain English to move around is surprisingly comforting. Then, too, when Delphi wants you to enter a command, it doesn't simply draw a symbol (like the exclamation mark [!] on CompuServe or the greater-than sign [>] on GEnie); it asks. For example, it might say, "What would you like to do?"

Even without the Delphi manual—a model of clarity—I was able to find

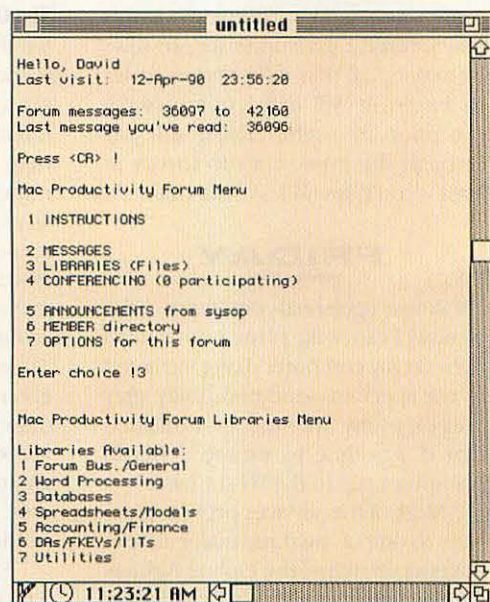
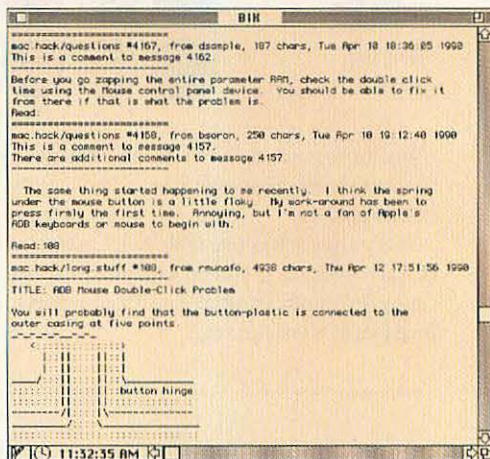
all three of the airline reservation systems; at the main menu, I simply typed Travel. The two free airline services—PARS and Eeasy Sabre—show you what flights are available between any two cities on a given day. And you can also find out what the lowest fare is for a particular route. Unfortunately, it's next to impossible to relate these two pieces of information—the schedule display doesn't show the fares, and the fare display doesn't show the schedule. That may be one reason the much superior OAG system carries a surcharge on all of the online networks. In any case, I eventually tracked down, and booked, a flight from New York to Los Angeles. The fare restrictions were clearly indicated on the screen, and a (human) travel agent

BIX Replies The BBS messages on BIX are separated by dotted lines; in this illustration, you can see several replies to a technical question about the mouse. BIX also offers a powerful Search command that lets you search the entire BIX network for a particular keyword.

CompuServe Text The quintessential text-based service: CompuServe. You see a numbered list of choices; at each exclamation-point prompt, you type the number of the choice you want. Since most menus don't let you escape to the previous menu it's possible to get good and lost on CompuServe. It's also possible to learn the secret command to backtrack—but you'll have to do some reading to find out.

later confirmed that I had secured the lowest fare available.

I became steadily more impressed with Delphi; a terrific introductory guided tour makes the service even easier to understand. Whereas CompuServe can seem hostile, and even GENie seems a little alien, Delphi just feels honest. No doors are locked or hidden away. Even though the text that scrolls up the screen is the same old 9-point Monaco, it's cleaner and less cluttered on Delphi than on other text-based services. There isn't as large a Macintosh presence as there is on some other networks, but the general-purpose services (fax; E-mail; shopping; games; news; weather, and sports; movie reviews; real-time chatting) are first-rate.



SATURDAY

In my modern-happy, ruthless quest for electronic productivity, I realized that I'd overlooked one small aspect of life. I had faxed my faxes, mailed my mail, and booked my flights electronically, but I hadn't really had fun—something not generally high on an online service's priority list.

Any, that is, except America Online. This Macintosh-and-Apple II-exclusive service was the perfect end-of-the-week break. There's not a single command to learn, not a page of manual to read, and not one navigational reason to keep a pencil and paper by your side. Like Connect, the America Online software provides an elegant graphic interface, complete with icons and windows. Instead of shoving the Macintosh interface to one side, as the text-based and Prodigy-type services do, America Online embraces it.

Attractive Interactive

Because America Online's most prominent attribute is its interactivity, you feel like you're walking through a room filled with people instead of mainframes; you see what people type (in any of the interactive "rooms"), and they see what you type. As with the chat features of other networks, it's liberating to attend a party without so much as combing your hair; but unlike those of other networks, America Online's chat service is intuitive, easy to use, and extremely responsive.

During one discussion—about the woes of city living, as I recall—I ducked into the generously stocked Mac software folders. Downloading a program is as simple as double-clicking on its icon to see a description and then clicking on the Download button.

Call them trivial pursuits, but I also had fun playing America Online's interactive games: word games, trivia quizzes, and even song-lyric tournaments. (Winners get free time online.) It's not actually the games, but rather the wisecracking banter that takes place during each round that makes these events so enjoyable. As a matter of fact, during one game I met a Los Angeles urban planner who, when I eventually arrived in L.A. on my electronically booked flight,

ONLINE FEATURES COMPARED

	America Online	BIX	CompuServe	Connect	Delphi	Genie	Prodigy
VITAL STATS							
Voice phone	800/227-6364	800/227-2983	800/848-8199	800/456-0553	800/544-4005	800/638-9636	800/776-3449
Access network	○	Tymnet	proprietary	Tymnet, Acunet	Tymnet, Telenet	proprietary	proprietary ¹
Start-up cost/monthly minimum	free/\$5.95	free/\$13.33	\$39.95/\$1.50	\$99.95/\$6	\$49.95 ² /none	\$29.95/none	\$49.95/\$9.95
Price per hour (peak/off-peak)	\$10/\$5	\$6/\$2 ³	\$12.80/\$12.80	\$10/\$5	\$17.40/\$7.20 ⁴	\$18/\$10	free/free
Interface	graphic	text-based	text-based	graphic	text-based	text-based	graphic
Proprietary software?	●	○	○	●	○	○	●
FEATURES							
E-mail/file transfer	●/●	●/●	●/●	●/● ⁵	●/○	●/●	●/○
Stock brokerage	○	○	●	○	○	●	●
Stock Quotes	●	○	●	●	●	●	●
Shopping	●	○	●	○	●	●	●
Airline reservations	●	○	●	○	●	●	●
Banking	○	○	○	○	○	○	● ⁴
Conferencing (chat)	●	●	●	○	●	●	○
Real-time seminars	●	●	●	○	●	●	○
Mac software downloads	●	●	●	● ⁵	●	●	○
Fax (cost)	\$1	○	\$0.75	\$0.80	\$1.25	○	○
U.S. mail (cost)	\$2	○	\$1.50	\$2	○	\$1	○
Games	●	●	●	○	●	●	●
Mac BBSs	●	●	●	●	●	●	●
Encyclopedia	●	○	●	○	●	●	○
Movie reviews	●	○	●	○	●	●	●
News/weather	●/●	●/○	●/●	●/● ⁵	●/●	●/●	●/●
Senior Net	○	○	○	○	●	○	○
Mac companies online	○	30	●	30	0	50	5
Estimated number of members	50,000	35,000	555,000	17,000	100,000	195,000	400,000

¹ Prodigy not available in all areas. ² Includes two nonprime hours. ³ These charges are for Telenet. ⁴ \$160 yearly plus Tymnet charges. A flat-fee Tymnet program is available for \$20 per month. ⁵ Extra cost. ● = yes ○ = no

gave me an architectural tour of the city. In person.

On the Line

The interface success of services like America Online and Connect clearly demonstrates how far the text-based services have to go before they are universally appealing; and the useful services offered by Prodigy and CompuServe illustrate how practical these networks may one day become.

But during my one sedentary—but stimulating—week online, I couldn't help but feel that the current networks are only in their infancy. "Why, when I was your age," I'll tell my kids, "I had to *click on icons* to move from forum to forum!" Calls are still prone to disconnection or static on the line; most text-based services are still frustrating to navigate; and there's still too much redundancy—I must have filled in my name an address five times on each service.

And I was amazed at the information I couldn't find online: TV listings; nationwide electronic banking; a dictionary; a zip-code finder; and an atlas. (When I needed to look up a city in Colorado one night, the only network that helped me was America Online. I walked into a roomful of people talking and said, "Hey! Anyone have an atlas?" Someone did.) And, of course, the information that *is* available is often hard—and expensive—to find.

Down the Line

But already the reasons to fear telecommunicating are fading. The graphic-interface services are so easy to use that you'll be productive the first time you go online; any Mac user who hasn't visited America Online is missing out on a great thing. Of the text-based services, nothing really compares with CompuServe for sheer informational majesty; despite its despised complexity and even less loved

pricing, it's a tremendous resource. Genie has much in common with CompuServe, but is less prestigious, less intimidating, and less expensive. Or, for an even friendlier text-based experience, try Delphi.

As I burst out of the apartment on Saturday night, I was amazed at how much I'd accomplished. Business, amusement, and even a sort of surrogate social life are available electronically. Surely someday these great efficiency enhancers will be part of everyone's everyday life. For the moment, however, it felt good to step back into the real world. ■

See *Where to Buy* for contact information.

.....
David Pogue, a Macworld contributing editor, is also a composer, magician, and manual writer in New York City. He apologizes to everyone who tried to call during the preparation of this article.

PRIME

A GUIDE TO VIDEO HARDWARE FOR THE MAC

by Peter S. Marx and Franklin N. Tessler ~

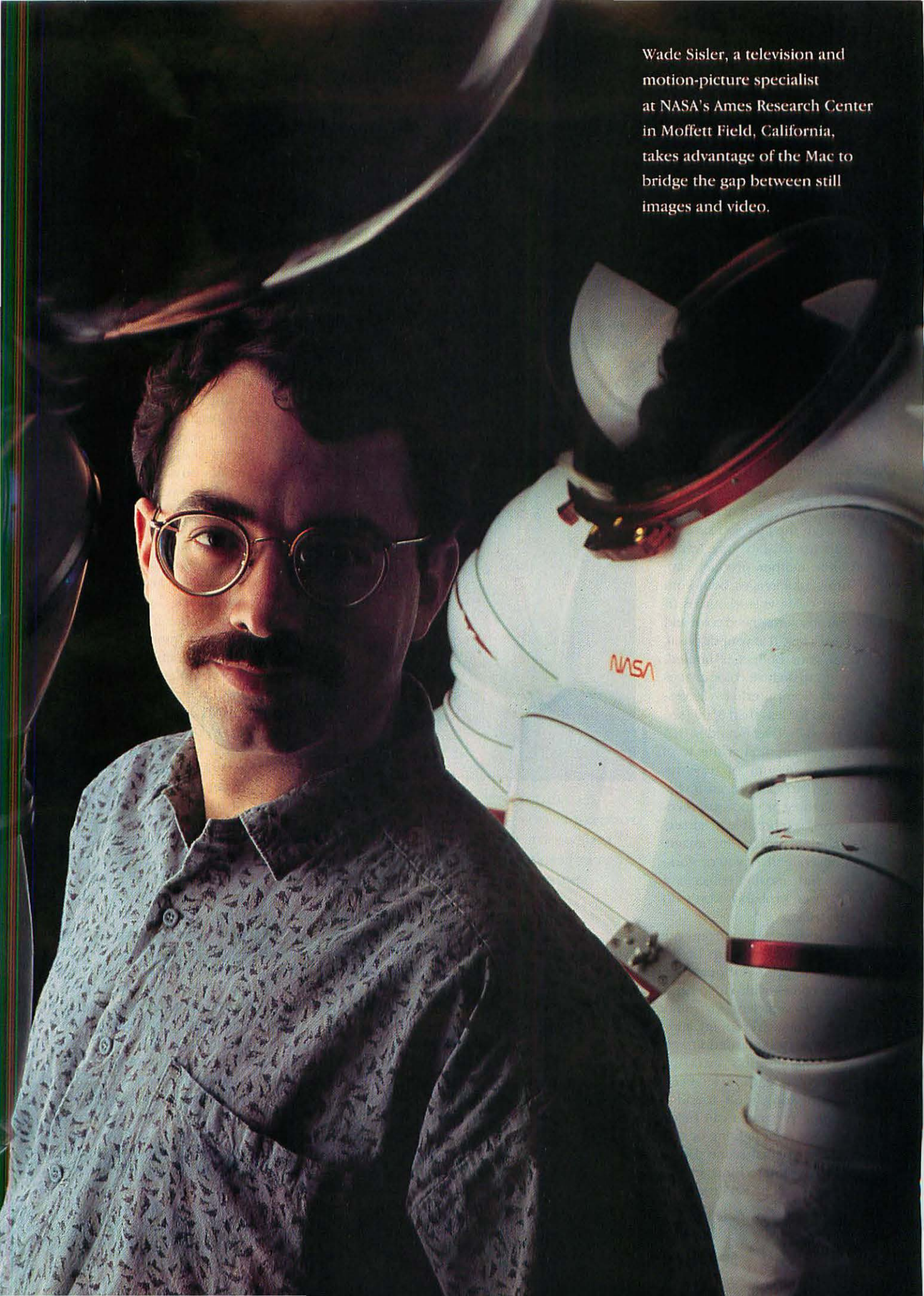
Amid the hype surrounding the promotion of desktop video and multimedia as the technical revolution of the 1990s, it's easy to forget that video applications are nearly as old as the Macintosh itself. Back in 1984, when Apple's most powerful CPU came with just 128K of memory, you could buy a *digitizer* to capture pictures from a video camera and display the *dithered* images on the Mac's 9-inch screen. (For a glossary of the italicized video terms, as well as some other terms commonly used in video, see "A Video Dictionary.") ~ Development of higher-end video applications had to wait until the introduction of the Mac II in 1987. With their expanded memory, larger monitors, slots, and color, the Macintosh II and its successors are valued tools in the

TIME

workshops of video amateurs and professionals alike. (For an extensive report on Mac applications in film and video, see "Star Quality," June 1989.) ~ The Macintosh wasn't designed to work with the video signal used by television or professional broadcasting equipment, and you won't be able to accomplish much video production with even the fastest Macintosh by itself (see "Mac versus NTSC"). Fortunately, as in other areas, third-party developers have jumped in to fill the gap. Video add-on hardware is one of the fastest-growing segments of the Mac marketplace, and new products are introduced almost daily (see "Mac TV Tools," September 1989). ~ In this article, we'll try to bring some order to the confusing array of video products for the Macintosh. Few individuals have the financial means of a professional TV-studio director, so we'll focus on Macintosh equipment suitable for three budget levels—

VIDEO

Wade Sisler, a television and motion-picture specialist at NASA's Ames Research Center in Moffett Field, California, takes advantage of the Mac to bridge the gap between still images and video.



low-end, midrange, and stratosphere. If you're new to video, we suggest you begin by turning to Jim Heid's primer, "Getting Started with Desktop Video," in this issue.

Budget Video

For less than \$1000, digitizers such as Koala Technologies' MacVision or Digital Vision's ComputerEyes let you import images from a video camera or VCR, and display or save them on the Mac. (Before you reach for that Indiana Jones tape, remember that the material on most videotapes is protected by copyright. The FBI warning tacked onto movie videos applies to any method of copying.) If you're working with a Macintosh Plus or SE, you'll only be able to view the images in dithered black and white, although the files you save retain up to 256 gray levels. While neither product captures color images, both work with color video sources. If you absolutely need color and have a Mac II at your disposal, but your budget is limited, you can digitize color images with ComputerEyes Professional for less than \$500 (see "Video-Product Roundup"). A major limitation at this level is the amount of time required to capture an image—all three products just mentioned require at least six seconds to process an image. Consequently, if you're working with moving subjects, a digitizer probably won't do the trick.

Images taken from video often require touching up before they're ready to print. Although the software that comes with video-capture hardware is sufficient for minor editing tasks, such as cropping and adjusting contrast, a dedicated image processing application lets you do much more. For example, the selecting, blending, and filtering tools found in image-editing programs can help compensate for poor lighting or composition of the original scene. Unfortunately, editing dithered images on a Macintosh Plus or SE isn't easy. A Macintosh II makes life much simpler by show-

ing you the captured image in true gray-scale or color.

Many late-model camcorders have character generators that let you superimpose multicolored titles on a video recording. That may be fine for family vacations, but what if you need to export Macintosh graphics to a videotape for training or sales? A new product from Mass Microsystems called the ColorSpace Plus/SE lets Macintosh Plus and SE users mix Mac graphics with any NTSC or S-Video source. While its \$1895 cost isn't exactly low-end, the ColorSpace Plus/SE brings video *overlay* capabilities to compact Macintoshes for the first time

video output: the TV Board (\$599), an 8-bit NTSC/PAL NuBus video board that will display 256 colors in the form of a standard composite video signal; and the TV Box (\$399), an external device that outputs 24 bits per pixel when used in conjunction with 24-bit color boards.

A Step Up

Most of the video hardware available for the Mac falls into the middle range. Although more expensive than digitizers, the products in this category fall within the price range of many budgets; many school media labs can afford these, especially when educational discounts are applied. Let's see what the extra money buys.

As we've said, digitizers usually take several seconds to capture video images, which makes digitizers useless for working with moving subjects. *Frame grabbers* like Advent Computer Products' Neotech Image Grabber, Data Translation's QuickCapture (for black and white) and ColorCapture (for color), RasterOps' FrameGrabber 324NC, and Personal Vision from Orange Micro all do their work within the $\frac{1}{30}$ second allotted to each video *frame*, allowing you to work in real time. At press time, Mass Microsystems announced QuickImage 24 (\$995), a NuBus board that captures NTSC or PAL video from any composite or S-Video source in real-time 24-bit color.

As long as your subject is moving slowly enough to appear sharp in individual frames, a frame grabber will do the job. (The ColorSnap-32 from Computer Friends takes $\frac{1}{5}$ second to digitize each frame, fast enough for many applications.)

The frame grabbers listed in "Video-Product Roundup" all come with software that lets you preview live video in a window on the Mac screen and capture and store individual images on disk. Products in this category are all NuBus boards, so they're only compatible with the Mac II. While extra RAM and a large hard disk are desirable



ALAN MILLER, VICE PRESIDENT IN CHARGE OF POSTPRODUCTION FOR REBO STUDIO IN NEW YORK CITY, BELIEVES THE MAC-BASED AVID SYSTEM HELPS TO INSURE REBO'S PLACE AS A PIONEER IN THE FIELD OF HIGH-DEFINITION VIDEO PRODUCTION.

at any price. Housed in a separate box, the ColorSpace Plus/SE attaches to the Mac's SCSI port. (The unit also requires a dealer-installed Video Adapter Assembly, also from Mass Microsystems, that goes inside the Macintosh case and costs an additional \$100.)

The ColorSpace Plus/SE lets you assign up to three colors to a Mac graphic and you can mix the graphic with a standard video signal for recording, or viewing on a video monitor. HyperCard-based titling software included with the package also makes it easy to superimpose text on a scene.

At press time, Generation X announced two lower-cost products for

for working with dithered images on a Mac Plus, they're essential for working with a frame grabber. Plan on at least 4 megabytes of RAM, especially if you're using MultiFinder. Also, even the best frame grabbers and image-editing applications go only so far in compensating for a poor video signal, so be sure that your camera or other video source is the best available. If you're working with prerecorded material, try to use a laserdisc rather than videotape, and use sufficient lighting when shooting live scenes.

Surprising as it may seem, the one feature missing from all of the frame grabbers mentioned so far is the ability to display images on the Macintosh monitor. They're all capable of converting an analog video signal into the digital format used by the Mac, but they rely on a separate video board to drive the Macintosh screen. While an extra NuBus board or two might not be an issue in a six-slot Macintosh II, IIfx, or IIfx, board space is at a premium in the compact IIfx and IIfx models. Until recently, combining video display and frame grabbing on one board came at a high price. But just as Mass MicroSystems' ColorSpace Plus/SE broke the price barrier for video overlay on the Mac Plus and SE, the ColorBoard 364 from RasterOps set a new standard for low-cost video display and image capture on the Macintosh II.

The ColorBoard 364 combines 24-bit color display and color frame-grabbing functions on one \$1995 NuBus board. The board is compatible with any NTSC or S-Video input signal, and it can drive an Apple 13-inch or compatible monitor. An optional tuner module, which connects to an Apple Desktop Bus (ADB) port, lets you tune to standard television broadcasts, from cable or an antenna. Aapps Corporation's DigiVideo is another NuBus board that provides live television in a Macintosh window. With a few mouse clicks, you can set the volume, change channels (yes, it's cable-ready), and adjust brightness and contrast. DigiVideo also works in the background under MultiFinder. While we doubt that anyone would choose to replace a television set with DigiVideo, the product does offer an intriguing glimpse into the future of television.

Video In and Out

Another Mass Microsystems product, the ColorSpace Ili, lets Macintosh II users overlay graphics on a video signal. In contrast to the three-color limit of the ColorSpace Plus/SE, the ColorSpace Ili can incorporate up to 256 different colors at once, making it suitable for many professional video applications. The board is compatible with either *composite* or *RGB* video input. The ColorSpace Ili can capture images, but digitizing a single frame takes 20 seconds. The ColorSpace Ili can't function as a Macintosh display board, since it can only drive composite video monitors.

IF YOU'RE INTENT ON
WORKING WITH BROADCAST-
QUALITY VIDEO,
YOU'LL HAVE TO INVEST
IN EQUIPMENT COSTING
AT LEAST AS MUCH AS THE
MACINTOSH ITSELF

Mass Microsystems offers another board called the ColorSpace FX, which works in tandem with the ColorSpace Ili to produce live video on an Apple-Color monitor. Using a bit of electronic wizardry, the two boards act together to combine a standard video signal with Macintosh graphics into one compatible with the Apple monitor. The ColorSpace FX also lets you add a number of special effects to a video sequence, including pan, zoom, shrink, mirror, and spin. Unlike the ColorSpace Ili, the Ili-FX combination can perform true 24-bit frame grabbing in 1/30 second.

Workstation Technologies' Moonraker is another board that can display live video on the Macintosh screen. Moonraker can handle two video signals at once, making it suit-

able for video presentations that take advantage of multiple sources. Frames digitized in real time are recorded directly into memory, so the board can digitize an uninterrupted video sequence. (The number of frames that can be digitized depends on how much memory is installed in the Macintosh.) Without another board, the Moonraker doesn't let you overlay video with graphics.

If you simply need to output Macintosh-generated graphics to video, and you don't require overlay or image capture, you can save money by purchasing an *encoder/decoder*. In contrast to video-overlay boards like the ColorSpace Ili, encoder/decoders are usually separate devices that convert video from one format to another. For example, the VIDI/O Box from Truevision can take an RGB signal from a Macintosh display board and convert it to NTSC video for recording. The VIDI/O Box also provides S-Video input and output. All of these devices can be as inexpensive as Computer Video's Video NTSC Encoder or as expensive as RGB Spectrum's \$9995 RGB/Videolink 600A. In addition to converting Macintosh RGB output to composite or RGB video, the RGB/Videolink 600A includes a filter to remove *flicker* from the video display, corrects for differences in *aspect ratio*, and adds color-bar generation for adjusting monitors.

Into the High End

If you're intent on working with broadcast-quality video, or if you need to coordinate multiple video and audio inputs, you'll have to invest in equipment costing at least as much as the Macintosh itself. When people think of high-end video, they usually have professional or broadcast applications in mind.

If you've ever watched the nightly news, you've seen a video image overlaid with multicolored graphics. The Mac is ideal for creating video overlays for broadcast because the Mac supports a wide range of software products and fonts, and it is wonderfully easy to use. Higher-end, relatively expensive products such as the NuVista board from Truevision incorporate 24-bit color display, frame grabbing, and overlay functions on a single board.

VIDEO-PRODUCT ROUNDUP

	Company	List Price	Minimum Configuration	Inputs ¹	Outputs ¹	Mac Interface	Number of Bits	Image Capture	Display	Video Overlay	Software
DIGITIZERS											
ComputerEyes	Digital Vision	\$249.95	512KE	A		Serial	8	●	○	○	○
ComputerEyes Professional	Digital Vision	\$449.95	Macintosh II	A, B		NuBus	24	●	○	○	●
MacVision	Koala Technologies	\$499.95	Plus	A		Serial	8	●	○	○	●
FRAME GRABBERS											
ColorCapture	Data Translation	\$2995	Macintosh II	A	A, C, D	NuBus	24	●	○	●	●
ColorSnap-32	Computer Friends	\$995	Macintosh II	A		NuBus	24	●	○	○	●
FrameGrabber 324NC	RasterOps Corporation	\$1495	Macintosh II	A		NoBus	24	●	○	○	●
Neotech Image Grabber	Advent Computer Products	\$1499 ²	Macintosh II	A, B		NuBus	8	●	○	○	●
Moonraker	Workstation Technologies	\$2995	Macintosh II	A, B, C		NuBus	24	●	○	○	●
NuVision	Perceptics Corporation	\$26,395	Macintosh II	E		NuBus	24	●	●	○	●
NuVista	Truevision	³	Macintosh II	C	C	NuBus	24	●	●	●	●
Personal Vision ⁴	Orange Micro	\$1499	Macintosh II	A, C		NuBus	24	●	○	○	●
QuickCapture ⁵	Data Translation	\$1295	Macintosh II	A, C, D		NuBus	8	●	○	○	●
Scion Image Capture Board	Scion Image Systems	⁶	Macintosh II	A, B, C		NuBus	24	●	○	○	●
ColorBoard 364	RasterOps Corporation	\$1995	Macintosh II	A, B	C	NuBus	24	●	●	optional	●
VideoDesk 1/24 ⁷	Computer Sciences Corporation	\$5795	Macintosh II	A, C, D	C	NuBus	24	●	●	○	●
VIDEO OVERLAY											
ColorSpace III	Mass Microsystems	\$2299 ⁸	Macintosh II	A, C	A	NuBus	24	●	○	●	●
ColorSpace Plus/SE	Mass Microsystems	\$1895	Plus or SE only	B, F	A, B	SCSI		○	○	●	●
Genlock Converter	Specialized Computer Systems	\$995	Macintosh II					○	○	○	○
SFX Option Board ⁹	RasterOps Corporation	\$1495	Macintosh II	A, B	A, B, C	NuBus	8	○	○	●	●
TV Producer Pro ¹⁰	Computer Friends	\$1099	Macintosh II	A	A	Apple Video Card	8	○	○	●	○
TV Producer RGB ¹⁰	Computer Friends	\$1599	Macintosh II	A	A, C	Apple Video Card	8	○	○	●	○
VIDEO OUTPUT											
Macintosh Display Card 4*8	Apple Computer	\$648	Macintosh II		C, G	NuBus	8	○	●	○	○
Macintosh Display Card 8*24	Apple Computer	\$899	Macintosh II		C, G	NuBus	24	○	●	○	○
Macintosh Display Card 8*24GC ¹¹	Apple Computer	\$1999	Macintosh II		C, G	NuBus	24	○	●	○	○
ColorBoard 208	RasterOps Corporation	\$495	Macintosh II		A, C, G	NuBus	8	○	●	○	○
ColorBoard 264	RasterOps Corporation	\$745	Macintosh II		A, C, G	NuBus	24	○	●	○	○
DigiVideo	Aaps	\$595	Macintosh II	A, F		NuBus	8	○	●	○	○
DisplayServer SE-TV Option ¹²	Lapis Technologies	\$528	SE only		A	Installs in SE		○	●	○	●
ENCODERS/DECODERS											
DT2879-60HZ	Data Translation	\$1495	NA	A, C	A, C	NA	NA	○	○	○	○
NTSC Converter	Specialized Computer	\$599	NA			NA	NA	○	○	○	○
Video NTSC Encoder	Computer Video	\$395	NA	C	A	NA	NA	○	○	○	○
RGB/Videolink 600A	RGB Spectrum	\$9995	NA			NA	NA	○	○	○	○
VID/D Box	Truevision	\$995 ¹²	NA	A, B, C	A, B, C	NA	NA	○	○	○	○

● = yes, ○ = no

Notes: ¹ A = Composite, B = S-Video, C = RGB, D = RS-170, E = RS-343, F = NTSC, G = NTSC RGB. ² \$499 for 24-bit Color Adaptor Module.³ 1-bit \$2995; 2-bit \$4495; 4-bit \$6495. ⁴ Requires Converter Module to digitize color from NTSC. ⁵ Digitizes RGB color in under one second with supplied ColorKit software.⁶ Videolmage 1000 Classic \$1095; Videolmage 1200 Professional \$1295; Videolmage 1500 Classic Plus \$1495; Videolmage 2000 Media Master \$1995.⁷ Two NuBus boards. ⁸ With ColorSpace FX \$3495. ⁹ Requires RasterOps ColorBoard 224, 724, or 232 for display. ¹⁰ Attaches to Apple Video Card.¹¹ Includes graphics acceleration. ¹² Produces noninterlaced video and needs converter for mixing with NTSC signals.

The NuVista comes in 1MB, 2MB, and 4MB versions; features *genlock*; and lets you program output resolution to ensure compatibility with a variety of monitors. In addition to the standard red, green, and blue channels, the 2MB and 4MB boards also incorporate a fourth channel, called the alpha channel. This 8-bit channel can be used to create special effects, and it's required for working with some types of studio video equipment.

The NuVista+ board should be on the shelves by the time you read this. In addition to the features above, the NuVista+ will include enhanced blending features; chroma keying abilities; and wipe and fade effects. The best news is that the board eliminates the need for a separate VIDI/O box.

Another new player, RadiusTV, was announced as we were going to press. RadiusTV—a video processing engine, external audio/video input processor, and television tuner—will display and digitize live 16-bit video images in real-time in a resizable window of up to 640 by 480 pixels. It works with 24-bit color adapter boards that support the high-speed block-transfer mode of the NuBus. A software desk accessory shipped with the product allows the user to access RadiusTV from within a running application. Another software program included in the package allows special effects and limited image processing.

Keeping in Control

The Mac can control postproduction video equipment too. For example, *SMPTE Time-Coding* is incorporated into products from Interactive Media Technologies and Specialized Computer Systems for controlling $\frac{3}{4}$ -inch VCRs, high-end $\frac{1}{2}$ -inch VCRs, and multitrack audio systems. Interactive Media Technologies' IMTX 8000, first introduced at the April 1990 Macworld Expo, is capable of controlling up to 12 video and 20 audio sources for dubbing, mixing, and display. The familiar user interface is based on SuperCard from Silicon Beach. Although the device costs a minimum of \$7000, it represents a price breakthrough in an industry where \$100,000 workstations are commonplace. Edit Worx, from Specialized Computer Systems, provides a similar function, permitting

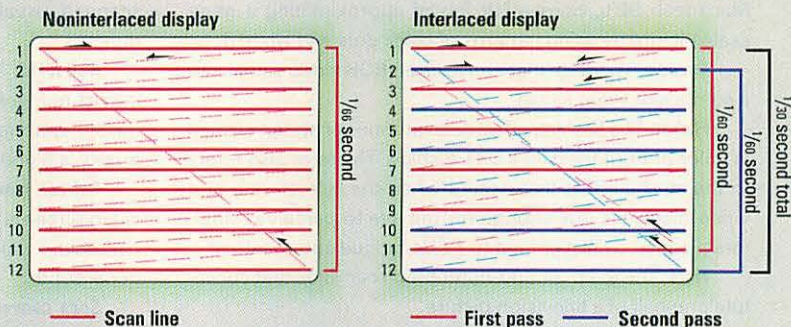
editors to assemble video sequences from multiple time-coded sources.

Measuring, Analyzing, and Dissecting

The Macintosh, as many researchers have discovered, is an excellent tool for scientific research. Video is now widely used in many areas of scientific research, including medicine. Extremely sensitive video cameras are often mounted on microscopes used to study blood and tissue samples. Perceptics Corporation's NuVision boards—the Pixel Grabber, Pixel Pipe-Line, and Mega Grabber—can extract

software is how to cope with the enormous quantity of data that their products generate. At about 1MB per 24-bit frame, even a few seconds of digitized video can consume hundreds of megabytes of disk space. Equally challenging is the problem of transmitting these vast amounts of digital information rapidly and cheaply. For years, Macintosh users have been able to reduce transmission costs and storage requirements by using file-compression utilities like Raymond Lau's popular application Stuffit (now available from Aladdin Systems). But while

MAC VERSUS NTSC



Macintosh displays are scanned in a single pass of the CRT's electron beam, starting at the top left and proceeding to the bottom right. For the Apple Video Card, the entire process takes $\frac{1}{60}$ second, with each scan line corresponding to a row of pixels.

NTSC television displays are scanned at a slower rate in two separate passes, one for the odd-numbered scan lines followed by one for the even-numbered lines. A complete frame consists of 512 lines, but due to overscanning not all lines appear on the screen. Since the NTSC standard doesn't allow for sufficiently rapid modulation of the signal, computer-generated graphics do not appear as clear on a television monitor as they do on a Mac-compatible monitor.

information from raw images and perform mathematical transformations on them in real time. The Mega Grabber, for example, can digitize 1320 by 1035 pixels from ultrahigh-quality slow-scan television images. Of course, systems with these capabilities often cost more than \$25,000.

Putting the Squeeze On

One of the greatest challenges facing developers of video hardware and

programs like Stuffit might achieve a 60 percent savings, the science of image compression promises far greater dividends.

To illustrate how image compression works, let's consider the unlikely case of a 1000-by-1000-by-1-bit image with one black pixel in the top left corner. In its raw form, the image file would occupy 1 million bits, or 122K. But the vast majority (99.9999 percent) of the image is white space. We could

A VIDEO DICTIONARY

Aspect ratio The ratio of the horizontal size to the vertical size of a picture. In television, the aspect ratio is 4:3.

Cathode ray tube (CRT) Output device in which a stream of electrons draws an image on a screen coated with phosphor dots, which glow when struck by the electron beam.

Composite video A standard video signal in which the red, green, and blue components are combined with a timing (synchronization, or *sync*) signal.

Decoder A device used to convert a composite video signal into red, green, blue, and sync components.

Digitizer A device used to convert video signals into a digital format suitable for display on a computer screen. Digitizers typically take several seconds to convert an image, and therefore require that the video picture be perfectly still.

Dither A technique for simulating more colors or shades of gray than are actually available in the current output device. For example, a black-and-white-only display like the Macintosh SE's, does a fair job of approximating a gray-scale picture by using patterns of black dots and white dots.

Encoder A device that converts an RGB video signal into a composite video signal.

Flicker The flashing effect seen at zones of abrupt change in color or brightness in a CRT display. The term also refers to the strobe effect that occurs when the refresh rate of a video display is low enough for the eye to perceive. Monitors plagued by flicker tend to cause fatigue and eyestrain.

Field The even- or odd-numbered scan lines that constitute one-half of a television picture.

Frame The complete television picture, consisting of two interlaced fields (see *interlaced video*).

Frame grabber A device that digitizes video at real-time rates, usually more costly than a digitizer.

Genlock A technique for mixing two or more video signals and ensuring that they remain in step. Combining video signals without genlock results in distortion.

Interlaced video The process by which two separate video fields form a television picture. In the NTSC format, the field consisting of the odd-numbered lines is drawn first, followed $\frac{1}{60}$ second later by the field with the even-numbered lines. Although the two fields don't actually appear at the same time, the human brain interprets them as a single frame lasting $\frac{1}{30}$ second.

JPEG standard A compression scheme proposed by the Joint Photographic Experts Group.

Noninterlaced video Typically used for high-quality computer-generated video.

NTSC The television standard currently in use in North America and Japan, an acronym for the National Television System Committee that created the standard. Detractors of the now-aging standard sometimes refer to it as "never the same color."

Overlay The process by which computer graphics are combined with video, to add titles and animation to a scene, for example.

PAL/SECAM These are foreign counterparts to the NTSC video standard. PAL (Phase Alternating Line) is primarily used in Western Europe while SECAM (Séquence de Couleurs avec Mémoire) is used in France, Eastern Europe, and the Soviet Union.

Pixel Short for picture element, equals one dot on a computer display. The AppleColor 13-inch monitor for the Macintosh II displays 640 pixels across and 480 down.

Raster scan The pattern in which a video screen is scanned, usually from the upper-left corner to the bottom right.

RGB NTSC This is NTSC color-composite video decoded into its red, green, blue, and sync components. Broadcast-quality systems tend to use this format because the image quality is higher.

Refresh rate The number of times per second that a video screen is repainted. NTSC video is shown at 30 frames per second while PAL and SECAM are displayed at 25 frames per second.

Scan converter A device that converts between video formats such as NTSC and PAL. These devices are usually very expensive.

Scan lines The individual lines in a video picture. They are composed of pixels in the computer world and analog signals in the video world. A set of scan lines makes up a field.

SMPTE Time Code A standard code, developed by the Society of Motion Picture and Television Engineers, used for identifying individual video frames in a sequence.

S-Video A form of NTSC video in which the chrominance (color) and luminance (brightness) signals are separated. S-Video produces slightly higher-quality images than color-composite NTSC.

Sync An electronic metronome used to keep video signals in step with one another. In the NTSC color-composite standard, sync is combined with the red, green, and blue signals. In RGB systems, the sync signal may exist separately or be combined with the green signal.

achieve a tremendous reduction by saving a code describing the image as consisting of one black pixel followed by 999,999 white pixels. Stored in this way, the file would be reduced to just a few bytes in size. Most real-world images are far more intricate than this

example. Still, using sophisticated image-analysis techniques, it's possible to achieve high compression ratios even with complex images.

An important factor that limits the degree to which an image can be compacted is the degree of compres-

sion loss. With many image-compression schemes, some details in the original image are lost when the file is compressed and decompressed. Compression algorithms that result in data loss are said to be destructive. For many video applications, the consid-

erable savings in file space is worth some minor image degradation. The *JPEG standard* is one destructive algorithm. The JPEG technique is sometimes referred to as discrete cosine transform compression. It relies on the fact that photographs and video images tend to change very little between neighboring pixels. Computer graphics, on the other hand, tend to change rapidly over small areas, such as in the black-to-white transitions between text characters and the surrounding space. Also, computerized data, such as bank records and computer programs, is extremely susceptible to destructive compression, which is why StuffIt obtains a compression ratio of only 2:1 or 3:1. By comparison, the JPEG algorithm achieves from 8:1 up to 25:1 compression.

Mac vendors are already exploring this technology. ImagePress, from Storm Technology of Palo Alto, uses JPEG in addition to other proprietary compression algorithms. Using software alone, ImagePress can compress a 1MB 24-bit file to 100K or less in under a minute. Also under development is a NuBus board that will achieve much faster compression times. C-Cube Microsystems also has software and a NuBus board based on JPEG. These boards will be exploited by software customized to work with them.

On the Horizon

Despite the recent proliferation of video hardware for the Mac, you are unlikely to confuse a Macintosh with a TV set. Even if you view video on a studio monitor, image quality isn't nearly as good as it is on a Macintosh display. But that's about to change, thanks to the development of a new television system called HDTV, short for High Definition Television.

The subject of much public debate over the past few years, HDTV increases resolution by doubling the number of *scan lines* in an image. The improvement is stunning, especially when compared side-by-side with an NTSC picture. (Another benefit of HDTV is its wider aspect ratio, which is much closer to the shape of a movie screen.) Although implementation of an HDTV broadcasting system in the United States remains mired in controversy regarding NTSC compatibil-

ity and competing formats, industry watchers have little doubt that HDTV will arrive within five years. HDTV will, for the first time, make video monitors suitable for displaying unmodified computer graphics.

At the same time, consumer video equipment has become more computer-like, with remote controls and menus. Although forecasting is always risky, it's likely that a single monitor will someday replace today's separate video and computer monitors. And today's video tuners for the Macintosh

may herald the development of hardware incorporating video and computer functions in one piece of equipment. Stay tuned. **M**

• See *Where to Buy* for contact information.

.....

Peter S. Marx is a developer of image-processing applications in Los Angeles.
Franklin N. Tessler, a radiologist and Macworld contributing editor, watches ultrasound images by day and television in his spare time.

VIDEO Q AND A

Q. What is the least expensive way of producing NTSC video from a Mac?

A. If you have a standard Apple video board and a Macintosh II, IIx, IIcx, IIci, or IIfx, you can produce low-quality, yet compatible, NTSC-compatible video for tape-recording. You need to have 32-bit QuickDraw and the NTSC INIT from Apple. Additionally, you must make your own output cable and be running in 1-bit graphics mode. As if this isn't hassle enough, you will also experience slower performance from the Mac.

The new generation of video boards from Apple, including the 8•24 and the 8•24GC boards, can produce video without the contortions needed in the above scenario. The Macintosh Portable is able to produce video with the addition of a video adapter available from Apple.

Q. How do you project onto a large screen from a Macintosh?

A. You need a Mac II, a multiscan projector (Sony, Panasonic, and Electrohome all produce these). You also need an encoder/decoder, to take the RGB signals from the Macintosh II's video board and convert them into signals compatible with the projector (see "Video-Product Roundup"). Typical rental on this equipment is \$500-\$700 per day in most large cities in the U.S.

Q. Can I capture color from a black-and-white frame grabber?

A. Both the Neotech Image Grabber and the Data Translation QuickCapture are able to capture color, albeit slowly. Working from a still video image, these boards capture three successive frames—for the red, green, and blue components—for each image.

In the case of the Neotech board, you need to have the Neotech Color Adapter Module, which can accept color-composite video and produce color images on the Macintosh II. With Data Translation's ColorCapture, you need RGB NTSC signals produced from composite video with an encoder/decoder.

Q. My Macintosh graphics look terrible when projected on my TV monitor. What's wrong?

A. Even with the best equipment at your disposal, when displaying Mac graphics on a television you'll achieve better results if you plan ahead. First, to avoid flicker, make all lines in the image at least two pixels wide. Also, be aware that television monitors typically omit the outer edges of a video picture, a process known as overscanning. To make sure that your precious graphics aren't lost in the conversion to NTSC, confine them to the central 80 percent of the Mac screen. Finally, to ensure legibility, avoid text smaller than 18 points.



CONNECTING WITH IBM MAINFRAMES



New products let IBM mainframes take advantage of the Mac

In large corporations, the IBM mainframe—thanks to its abundance of processing power and disk storage space—is king. The mainframe holds all database information vital to the corporation, and often it acts as the central E-mail hub for companywide communication. But because the data on the mainframe is so important, users are always competing for computer resources. And sometimes even the most powerful IBM mainframe can't provide enough power.

Enter personal computers like the Macintosh. By acting as intelligent terminals via terminal-emulation software, Macs can offload processing from the mainframe. Initially, using a Mac to access a mainframe just meant that the mainframe didn't have to send as much information over the network to create a display. Now, thanks to more sophisticated Mac-to-IBM connectivity products, both the mainframe and the Mac can actually share the task of processing of data across a network.

Terminal Functionality

Like older IBM 3270, Centralized Unit Terminal (CUT) terminals, Macs traditionally connect to mainframes with a bulky coaxial cable in a one-to-one fashion. The coax plugs in to an interface board in the Mac—such as one of the MacMainFrames from Avatar, Digital Communication Associates' (DCA) MacIrma, or the Apple Coax/Twinax Card—and into a coax port on an IBM 3174 *cluster controller*. Using a CUT-style terminal emulator, the connected Mac can run one host application, called a *session*, with the mainframe at a time.

An example of this traditional Mac-to-mainframe relationship is Simware's SimMac, originally named Mac3270. SimMac, which previously offered 3270 CUT terminal emulation only over asynchronous connections, now supports a variety of hardware links, including *protocol converters* and Apple, Avatar, and DCA coax interface boards.

Other players in 3270 terminal emulation for the Mac—Apple, Avatar, and DCA—now offer terminal emulators that support IBM's Distributed Function Terminal (DFT) specification. DFT terminals support multiple sessions over one peer-to-peer coax connection, so you can run more than one session at the same time.

In addition to multiple sessions, there's another advantage to DFT-style terminals. DFT emulators reduce communications traffic between terminals and the mainframe. They require less supervision from the mainframe and cluster controller be-



**Gateways
reduce
commu-
nications
traffic and
cable costs**

cause DFT terminals are more intelligent than CUT-style 3270 terminals. As a result, DFT terminals save computing resources on the host, enabling it to concentrate on running programs rather than on handling terminals.

Apple's MacDFT, Avatar's MacMainFrame family, and DCA's MacIrma all let you open up to four session windows simultaneously on the Mac. In addition, you can dedicate a fifth session to a LaserWriter. That capability lets you print jobs from the mainframe on a LaserWriter that's on an AppleTalk network.

Party Line

You can reduce communications traffic even more—not to mention coaxial cable installation costs—between a mainframe and connected Macs by using *gateways*. In contrast to the one-to-one connections offered by coax interface boards, gateways link entire AppleTalk networks of Macs to a mainframe. The gateway provides the one point of connection to the mainframe's cluster control-

ler via either Synchronous Data Link Control (SDLC), token ring, or coax links, sending the mainframe's commands and data to the appropriate Macs on an AppleTalk network.

To use the gateway, Macs run the usual IBM terminal-emulation software discussed earlier. Thus the AppleTalk network serves not only as a way to connect multiple Macs, but also as a way for those Macs to access a mainframe.

When should you use a gateway instead of a traditional one-to-one coax connection? The most appropriate situation is when Macintosh users don't require mainframe access all the time. For instance, a user who checks E-mail on the mainframe or sometimes downloads data from a database doesn't need a permanent connection to the mainframe. A system programmer, however, might require access to the mainframe all the time. A gateway allows managers to distribute connections among users according to need. The gateway can replace hardwired coax links, without necessarily compromising the needs of full-time users.

Tri-Data Systems, with its Netway 1000AEX, was the first company to offer an IBM gateway for Mac. The Netway 1000AEX essentially took the place of an IBM 3174 cluster controller; it used the SDLC synchronous modem link to connect a network of Macs to the mainframe.

In the past year, however, four new gateways have appeared on the scene. Tri-Data's Netway 2000 is a total redesign of the Netway 1000AEX built around a Sun Microsystems' Scalar Processor ARCHitecture (SPARC) microprocessor. Thanks to the SPARC processing power, the Netway 2000 can handle four times as many sessions as before—64 versus 16. The Netway 2000 also supports AppleTalk connections other than LocalTalk, for example TokenTalk and EtherTalk.

Unlike Tri-Data's Netway 2000, Avatar's MacMainFrame gateways use software running on a Mac II to link networked Macs to an IBM mainframe. The Mac II must, of course, connect to both AppleTalk and the mainframe to perform its gateway tasks. On the mainframe side, MacMainFrame gateways support coax, token ring, or SDLC links. To attach to the Mac network, you can either use the Mac's built-in LocalTalk port, or add an Ethernet or token ring board.

One gateway Avatar offers, the MacMainFrame Coax Gateway, may seem strange because it's a five-session coax gateway. Certainly, a single DFT user can use all five sessions on a Mac. However, the gateway also allows those five sessions to be distributed among a maximum of five users, without requiring each user to have a separate coax interface board.

DCA's approach to gateways is similar to Avatar's, with three notable exceptions. First, DCA's MacIrmaLAN gateways don't support a coax con-

IBM'S OTHER COMPUTERS

Even though primarily known for its mainframes and PCs, IBM also makes a line of midrange or departmental computers. Although many older System/3X computers (System/34, /36, and /38 machines) have been displaced by the new family of AS/400 midrange computers—offering similar capabilities but a newer architecture—options exist for connecting Macs to both System/3X and AS/400 computers.

Midrange connections are made similarly to mainframe connections. The main difference is that the majority of midrange computer applications depend on the IBM 5250 terminal—not the IBM 3270 terminal. Just as 3270 terminal emulation is a popular path to Mac-to-IBM mainframe connectivity, IBM 5250 terminal emulation is a primary means of connecting a Mac to an IBM midrange computer.

Both Andrew/KMW Systems Corporation and IdeAssociates offer terminal-emulation and file-transfer software, as well as internal interface boards for Macs. In addition, Andrew/KMW recently merged with Emerald Technology, which also offers a 5250 board and software for the Mac.

Andrew/KMW, Perle Systems, and Protocol Computers produce external protocol converters. These devices convert the character strings from a Mac's terminal emulator into characters and commands that the midrange computer can understand and respond to.

Unlike in the Mac-to-IBM mainframe world, gateways have yet to appear for Macs and the IBM midrange systems in great numbers. The only option is Andrew/KMW's TwinAccess ApLINK, which allows a LocalTalk network of Macs running 5250 terminal emulators to share an interface board in a Mac II that in turn connects to an IBM midrange computer.

nection to the mainframe—only token ring or SDLC. Second, Macs wanting to access MacIrmaLAN gateways must be on either a LocalTalk or TokenTalk network; DCA currently does not support EtherTalk connections. Finally, because the gateways are based on existing IrmaLAN technology, the company uses a PC, not a Mac, as the gateway computer. For Macs to use the gateway, you must install an interface board in the gateway PC.

Despite the PC requirement, I don't see DCA's PC implementation of MacIrmaLAN as a significant hindrance to Mac-IBM connectivity. Companies with IBM mainframes tend to have Macs coexisting with PCs anyway. Using a PC clone as a gateway is cheaper than using a Mac II (as Avatar requires); in addition, PC token ring add-in boards are less expensive than their Mac counterparts.

From Novell comes yet another approach to gateway services—via IBM's grand plan for networking all types of computers, called Systems Application Architecture (SAA). Novell's Netware 386 Communication Services allows users of its Netware 386 network operating system to take advantage of SAA. Now that Novell also fully supports the Mac with Netware 386, anyone running a 3270 DFT-style terminal emulator on a Mac can access an IBM mainframe or AS/400 midrange computer via a token ring connection.

Another aspect of SAA is a scheme called Advanced Program-to-Program Communications (APPC). APPC allows computers on the network to communicate with each other as peers. APDA's MacAPPC provides programmers with the software tools necessary to develop APPC services for SAA networks. For example, by using MacAPPC, Mac applications can dynamically exchange information with IBM mainframe-based applications.

Improving the Characters

So far, all I've really discussed is how to make a relatively simple connection from a Mac to an IBM mainframe. But that really is only the first step. The next is adapting the IBM user interface to better reflect the Mac interface.

Whether you use a direct coax link or a gateway, CUT- or DFT-style terminal emulation, you still face the standard character-based display of the IBM mainframe. Given enough time, dedicated users can master IBM mainframe commands. For occasional mainframe users, however, those often-arcane commands can be confusing and intimidating. The need for an easy-to-use interface, such as the Mac's, is therefore a compelling one.

Even IBM has recognized this necessity. OfficeVision presents the same interface on mainframes, minicomputers, and PS/2 computers, and is IBM's attempt to integrate different types of



DAN ESCOBAR

machines and operating systems. IBM currently lacks tools for integrating Macs into OfficeVision.

However, there are many other ways to provide a Mac-style interface to a mainframe application—including OfficeVision. Apple, Avatar, DCA, and Tri-Data all provide standard application programming interfaces (APIs) that enable developers to write customized Mac programs that use their own hardware. In general, programs that take advantage of APIs preserve both the interface of the Mac and the integrity of the mainframe data. Users can automate routine operations like logging on to and off of the mainframe, accessing E-mail, even downloading information from a mainframe database to a Mac application for analysis.

To simplify the development process somewhat, the APIs from these four vendors include HyperCard support, which makes it easier to prototype interfaces and applications for use with an IBM mainframe. But until a single API is offered for all Mac-to-IBM hardware, programmers must write different code for each vendor's interface boards. Luckily, there is a trend to one sole API—not surprisingly, Apple's 3270 API—which has been endorsed by Avatar, DCA, and Tri-Data.

Higher-Level Tools

APIs aren't the only way to provide Mac interfaces to mainframe applications. Tools such as Mitem Corporation's MitemView, APDA's MacWorkStation, and Masquerade3270 from Connectivité Corporation fit the bill. In addition, Simware's SimMac offers a presentation capability that lets you design a more Mac-like interface to 3270 mainframe applications. Because these tools are more user-adaptable, they are often easier for both system programmers and end users to work with.

MitemView uses hardware-vendor APIs to

At American President Systems in Oakland, California, programmers like Barry Polley are looking at several ways for Macs to access mainframe-based data. They've found developing a prototype graphical interface with MitemView and HyperCard takes about a day.



**Thanks to
APIs and
HyperCard
tools, Mac
users won't
see the IBM
mainframe
interface**

control communications between a Mac and a mainframe. However, MitemView allows programmers to make maximum use of HyperCard with a series of HyperCard external commands (XCMDs). You define patterns of characters from the mainframe for a stack to recognize and respond to. Those patterns and responses, which are stored in the HyperCard stack, can then control different HyperCard displays of mainframe applications; the Mac user sees only the HyperCard displays.

With MacWorkStation, the actual IBM mainframe application issues commands relating to a user interface. Those commands are in turn received by the Mac, where a Mac application accepts them and turns them into typical Mac interface elements: windows, menus, and dialog boxes. Because both computers share in the processing load—the mainframe runs its application, and the Mac runs its application—and because the two applications communicate with each other, MacWorkStation is an example of a *distributed-processing* approach to Mac-IBM mainframe connectivity.

Originally developed for asynchronous serial communications, MacWorkStation now supports the block-mode data-transmission method typi-

cally associated with IBM mainframe communications. (IBM mainframes normally send data in blocks large enough to fill an entire terminal screen, rather than just character-by-character or line-by-line.) MacWorkStation's support for block-mode data transfers makes it easier for developers to handle incoming data when working with IBM mainframe applications.

Like MitemView, Masquerade3270 uses APIs to talk to the mainframe. However, Masquerade3270 offers a very different approach to creating Mac-like applications that communicate with an IBM mainframe. With Masquerade3270, the user controls the design process. First, you have Masquerade3270 save all the IBM screens from a session. Then, you define the appropriate inputs to those screens (for example, name and password for the log-on screen) and create dialog boxes for entering those inputs. Masquerade3270 even lets you design special icons for functions or windows for other data—such as an E-mail message—and combine those icons and windows in a stand-alone application.

SimMac's presentation capability, which Simware calls Views, allows programmers to associate a familiar Mac button, list, or pop-up menu with a script that carries out an entire series of mainframe commands. Scripts can automate communications, mainframe navigation, log-on procedures, and other tasks. As a result, Mac users don't have to work directly with the mainframe interface.

IBM CONNECTIONS WITH TCP/IP

IBM has long maintained its own networking architecture, first called Systems Network Architecture (SNA). SNA is now incorporated in a larger IBM scheme called Systems Application Architecture (SAA).

While much of IBM's networking depends on physical links using SDLC, coaxial cable, and token ring, the company has recently begun to endorse Ethernet as another physical medium for connections. At the same time, IBM has started to support a popular Ethernet protocol, Transmission Control Protocol/Internet Protocol (TCP/IP), that's primarily used by UNIX computers. IBM's endorsement of TCP/IP coincides with the trend of large corporations looking to TCP/IP as the protocol for interoperability—that is, linking together dissimilar computers running dissimilar operating systems.

Macs can participate in TCP/IP links to IBM mainframes in two ways, terminal emulation and file services. For instance, Intercon System Corporation's TCP/Connect II terminal emulator includes a tn3270 option, which handles 3270-style terminal emulation over TCP/IP networks. Also, if an IBM mainframe is running Network File System (NFS) file-server software, a Mac can use the IBM computer as a file server. To do this, you need Cayman Systems' GatorBox gateway and GatorShare software. The GatorShare software allows the Mac users to see NFS file servers as AppleShare servers by converting between AppleShare requests on the user's side and NFS commands on the server's side.

Other Pieces of the Puzzle

In addition to the distributed processing support offered by MacAPPC, which is designed to let corporate MIS departments create their own applications, access to E-mail and databases on IBM mainframes is becoming more distributed.

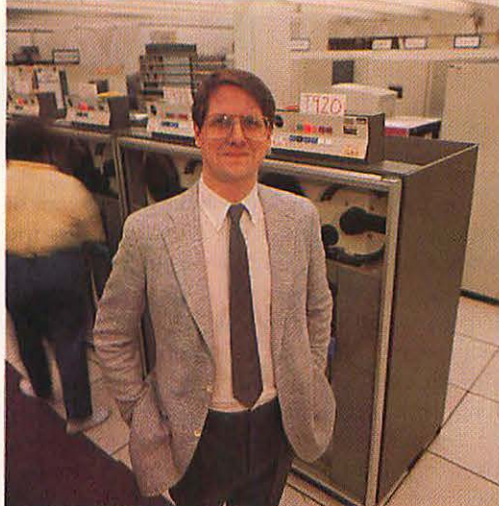
Anyone using a terminal emulator can readily access PROFS, IBM's popular mainframe E-mail system. CE Software, Microsoft, and TOPS have all announced gateways that allow their LAN-based E-mail systems to exchange messages with the PROFS mail system. CE Software is developing its own PROFS gateway for QuickMail 2.2, QM-Professional Gateway, while Soft-Switch is providing SNADS Gateway/MSMail, the PROFS gateways for Microsoft Mail 2.0, and is also developing a PROFS gateway for TOPS InBox 3.0.

Much of the corporate data in the United States resides on IBM mainframes. Accessing that data, however, isn't always simple or straightforward for Mac users. Using a product like Apple's Data Access Language (DAL, formerly known as CL/1), users of Excel, Wingz, 4th Dimension, and other databases and spreadsheets can request specific data from mainframe databases using Structured Query Language (SQL) and manipulate that data within their own Mac applications.

Oracle Corporation offers similar connections through the use of Oracle for the Mac.

Keep Up with Big Blue

If you only have a few Macs connected to a mainframe, all you probably need is a standard coax connection. That's particularly true if you use the Mac as your primary mainframe terminal. Whenever possible, stick with DFT-style emulation because it uses less of the mainframe's resources.



JOHN HILLERY

At the University of Michigan in Ann Arbor, a campus-wide mail system is based around IBM mainframes. Programmers like Gordon Leacock used MacWorkStation so people could use the Mac's interface to access the mainframe.

TALKING TO BIG IRON

3270 Terminal Emulation

Apple Computer

- Apple Coax/Twinax Card with MacDFT, \$1495
- MacDFT, \$245

Avatar Corporation

- MacMainFrame DFT, \$495 (software upgrade)
- MacMainFrame DX, \$1195
- MacMainFrame Graphics, \$1495
- MacMainFrame SDLC Workstation, \$1295
- MacMainFrame Token Ring Workstation, \$1295
- MacMainFrame II/CUT, \$995
- MacMainFrame II/DFT, \$1295
- MacMainFrame SE/CUT, \$995
- MacMainFrame SE/DFT, \$1295
- MacMainFrame SE/30/CUT, \$995
- MacMainFrame SE/30/DFT, \$1295

Digital Communication Associates

- Irmaprint 2, \$1795
- MacIrma \$1195
- MacIrma Graphics, \$1295
- MacIrma SE/30, \$1195
- MacIrma WorkStation, \$1395

Intercon Systems Corporation

- TCP/Connect II, \$495

Simware

- SimMac async version, \$265
- SimMac network version, \$340

3270 Gateways

Avatar Corporation

- MacMainFrame Coax Gateway, \$2495,¹
- MacMainFrame SDLC Gateway, \$2495;² \$4495;³ \$6495⁴

- MacMainFrame Token Ring Gateway, \$2495;² \$4495³

Digital Communication Associates

- MacIrmaLAN 802.2 Gateway Server, \$3995;⁵ \$5995⁴
- MacIrmaLAN SDLC Gateway Server, \$4495;⁵ \$6495⁴

Tri-Data Systems

- Netway 1000AEX, \$3995
- Netway 2000, \$9995

5250 Terminal Emulation

Andrew/KMW Systems Corporation

- NetAccess, \$3995
- TwinAccess, \$1095
- TwinAccess Series II, \$1695-\$3595
- TwinAccess Series III, \$1295

Emerald Technology

- MacTwin II, \$1095
- MacTwin SE, \$995

IdeAssociates

- Ideacomm Mac, \$1195

Perle Systems

- PDS 350/294, \$3995
- (4 ports)-\$11,795 (20 ports)
- Perle Model 3, \$1995
- (1 port)-\$3795 (7 ports)

Telematics International

- 5250/T, \$2925
- MacCOM \$1100-\$2500

Other

APDA

- Data Access Language (DAL) Developer's Toolkit, \$695
- Data Access Language (DAL) Server for MVS/TSO, \$20,000

Data Access Language (DAL)

- Server for VM/CMS, \$15,000
- MacAPPC Developer's Kit, \$2500⁶
- MacWorkStation Developer's Kit, \$2500⁶
- MacX25, \$800
- MacAPPC Evaluation Kit, \$100⁷
- MacWorkStation Evaluation Kit, \$100⁷

Apple Computer

- Apple Serial NB Card, \$1195
- TokenTalk NB Card, \$1250

Avatar Corporation

- MacPROFF, \$195

Cayman Systems

- GatorShare, \$1995

CE Software

- QM-Professional Gateway, NA

Connectivité Corporation

- Masquerade3270 developer package, \$400-\$1200
- Masquerade3270 user modules, \$200-\$500

Digital Communication Associates

- MacIrma API, \$195

Mitem Corporation

- MitemView, \$995

Novell

- Network 386 Communication Services, NA

Oracle Corporation

- Oracle for the Mac, \$699 (database); \$999 (network)

Soft-Switch

- SNADS Gateway/MS Mail, NA

Tri-Data Systems

- Netway API Developer's Toolkit, \$495

¹5 sessions. ²8 sessions ³32 sessions. ⁴64 sessions. ⁵16 sessions. ⁶Contact Apple for site-license information. ⁷Single-user license.

It's getting easier to connect Macs and IBM mainframes

On the other hand, if you have a network of Macs, all of which only occasionally access the mainframe, then a gateway—even a coax gateway—is a good choice. SDLC gateways are particularly useful for companies that need to connect regional offices to a centralized mainframe; with the right equipment, you can get connection speeds of up to 56 kilobits per second (kbps).

Terminal emulation and file transfers over a token ring connection are generally faster than over a coax connection, but I think that's little

reason to go out and install a token ring network. Token ring gateways for the Mac are aimed at installations that already have a token ring installed, say for connecting mainframes and PCs.

If you're interested in changing the interface to IBM applications, MacWorkStation is probably the most powerful tool for creating a Mac interface to mainframe programs, but it requires writing code on both the Mac and the mainframe. Many corporations that use mainframes are reluctant to modify all of their existing programs in order to support MacWorkStation.

In such situations, MitemView, Masquerade3270, or SimMac is a better solution, since these programs require no modification on the mainframe side. To the mainframe, a Mac appears as just another terminal; the Mac handles all interface elements.

MitemView's intelligence revolves around recognizing strings of characters. Defining those strings and the appropriate responses in IBM communications is a task probably better left to a programmer than to an end user. However, MitemView also supports VAXs, and even bulletin boards, and can provide interface consistency for a large variety of connections.

SimMac's big advantage is that it runs on a 1-megabyte Mac and over asynchronous connections with a mainframe. It also supports multiple windows, color, and large-screen monitors on the Mac. Simware offers a PC version of SimMac, SimPC, that features similar capabilities.

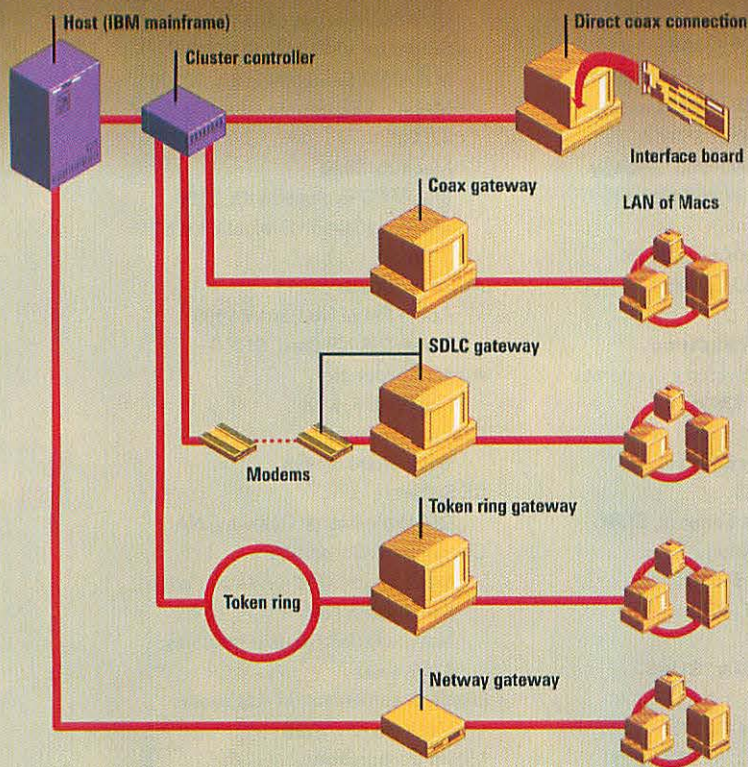
Masquerade3270 deals with the IBM screens familiar to any user of an IBM terminal and has simple—but powerful—tools for linking user responses to those screens. You can use Masquerade3270 to create stand-alone applications smaller than MitemView HyperCard stacks. Masquerade3270 has my vote as the easiest tool with which users can define their own interface to an IBM mainframe.

Picking the right Mac-to-IBM solution isn't easy, especially since so many new connectivity solutions have appeared in the past year. One thing is for sure, though: connectivity solutions between a Mac and IBM mainframe have improved. Just as software that makes it easier to use Macs as front ends to mainframe databases is coming into its own, so too are the hardware bridges that connect the Mac to corporate networks ruled by the IBM mainframe. ■

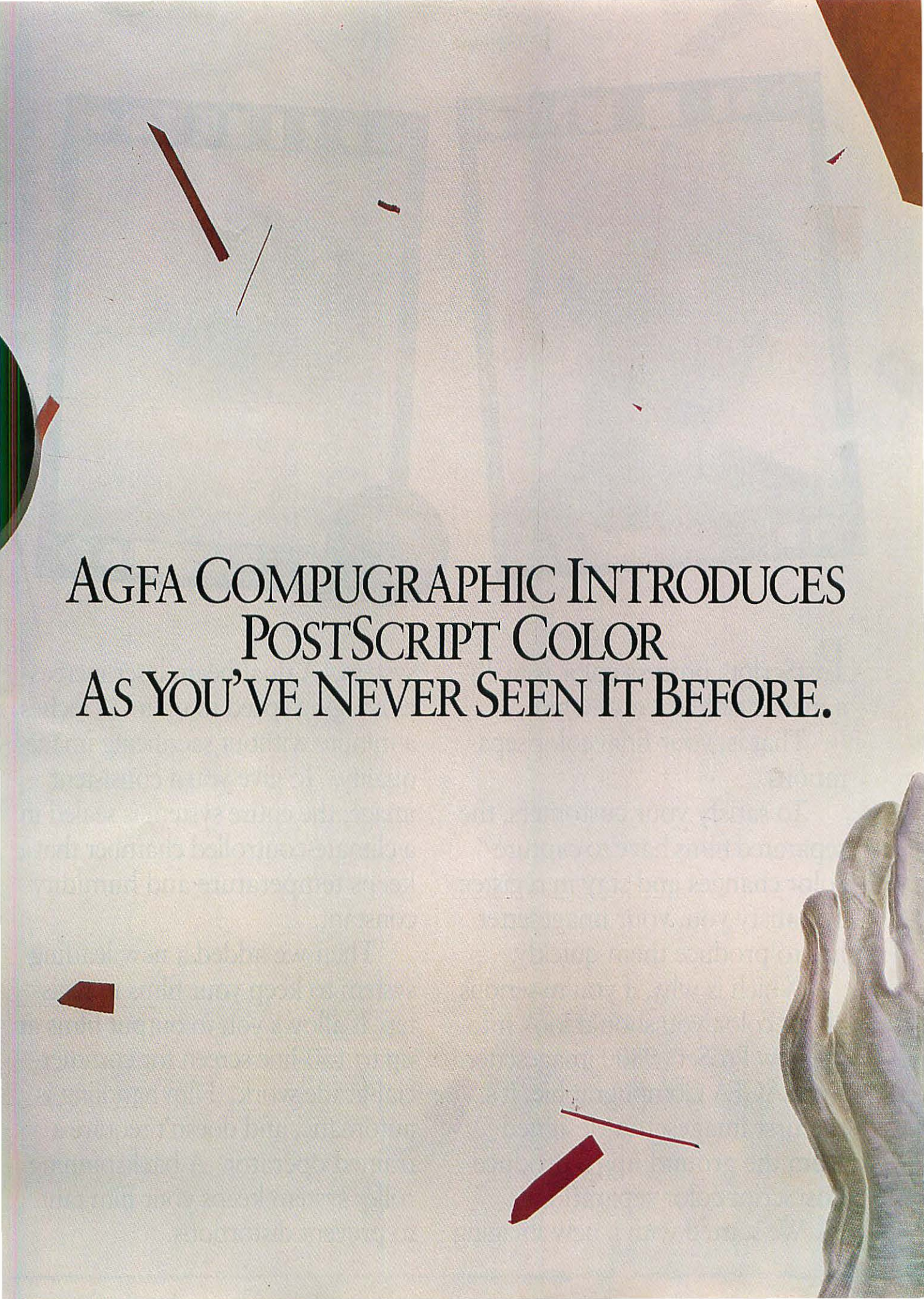
See *Where to Buy* under Mac to IBM for contact information.

.....
Dave Kosiur, a Macworld contributing editor, is the editor of *Connections*, a technical journal on Macintosh networking.

MAC-TO-MAINFRAME CONNECTIONS



There are two primary ways to connect Macs to an IBM mainframe. The first, a direct coaxial link, is a one-to-one connection; it requires an add-in interface board in each Mac. The second, a gateway, allows any Mac on an AppleTalk network to access the mainframe via a variety of connections—coax, SDLC, or token ring. The gateway can be either a stand-alone hardware device—like Tri-Data's Netway 2000—or a computer running special software along with the appropriate hardware interface (for example, a token ring interface board). Avatar's MacMainFrame gateways run on a Mac and support the three types of connections (coax, SDLC, and token ring). DCA's MacIraLAN requires an IBM PC (or a PC clone) and supports either SDLC or token ring. The Netway 2000 gateway is the only device that does not require a cluster controller; it can connect directly to the mainframe.

A hand holding a pen is visible on the right side of the page. Several red ink strokes, including a long diagonal line, a short horizontal line, and a small dot, are scattered across the page. The background is a light, textured surface.

AGFA COMPUGRAPHIC INTRODUCES
POSTSCRIPT COLOR
AS YOU'VE NEVER SEEN IT BEFORE.



PostScript® process color is really a matter of black and white.

That is, your final color separations.

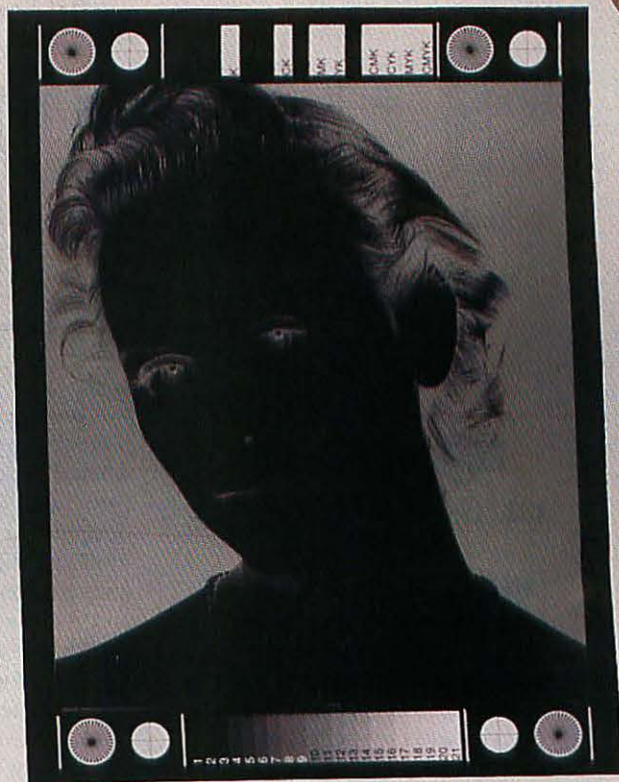
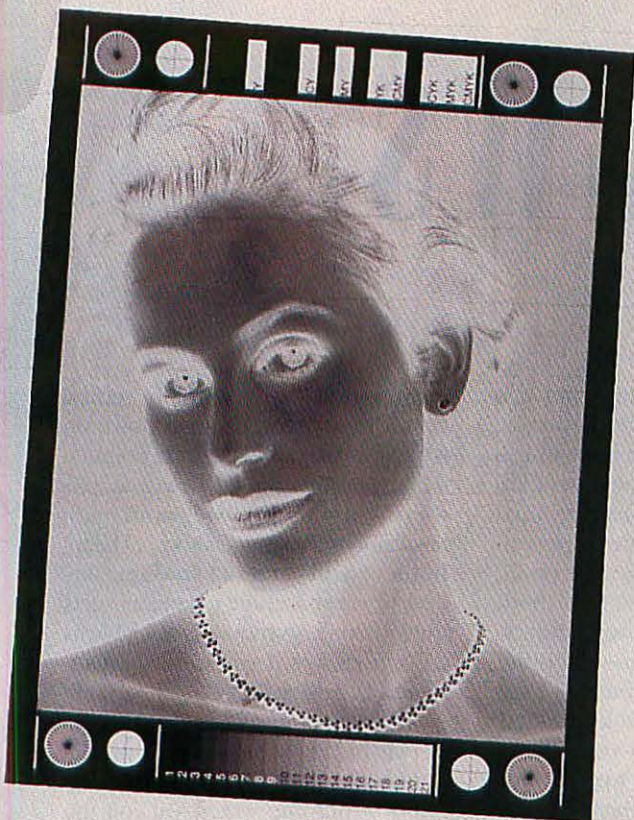
To satisfy your customers, the separated films have to capture color changes and stay in register. To satisfy you, your imagesetter has to produce them quickly.

Which is why, if you're serious about color, you should look into the new ProSet™ 9800 imagesetter from AGFA Compugraphic. It's the first imagesetter designed from the ground up to produce PostScript color separations.

We started with a new imaging

system. A dual-beam laser increases imaging speed to up to 15 inches a minute without sacrificing image quality. To give you a consistent image, the entire system is sealed in a climate-controlled chamber that keeps temperature and humidity constant.

Then we added a new leading system to keep your films in register. It allows you to output films at up to 150-line screen for commercial-grade work. Film handling is automatic, and doesn't require a trained operator. A backspinning roller system keeps your film taut to prevent distortions.



Anderson & Lambie, Inc.

Even the raster image processor is new. The 50MHz Max Plus RIP processes color files up to 250 percent faster than our standard RIP, thanks to special contone processing software. Of course, the new RIP processes your PostScript text and line art files faster, too.

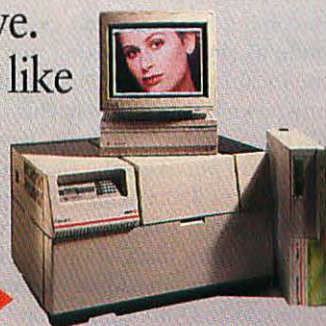
ProSet was designed with your growing business in mind. Its RIP is modular, to allow for easy upgrades. And, like all our imagesetters, it's a true PostScript machine, not a clone. Which means you can spend more time running your files and less time trying to figure out

why they won't run.

PostScript process color is the next logical step, and ProSet 9800 is the imagesetter designed to do it justice. For more information, or to arrange a demonstration, call 1-800-227-2780 (in Canada call 1-800-387-9533), ext. 9800.

When you're at your demo, be sure to ask to see a sample proof of the image above.

Because color like this, you have to see to believe.



AGFA 

AGFA COMPUGRAPHIC DIVISION



REVIEWS



Portable Laptop Macintosh

OUTBOUND LAPTOP SYSTEM

Pros: Smallest, lightest, least expensive true Macintosh portable; backlit screen; good documentation; well-engineered removable battery system; great carrying case. **Cons:** Requires the chips from an SE or Mac Plus; some screen shadowing and cursor "submarining." **Company:** Outbound Systems. **Requires:** Mac Plus or Mac SE. **List price:** \$2999 (with 1MB floppy drive); \$3999 (with 40MB hard drive).



Everybody—even Apple—agrees that the Macintosh Portable isn't the ideal portable Mac. It's too expensive, too heavy, and too big to whip open in an airplane seat.

Yet without access to proprietary Apple technology, how is any third-party company expected to engineer a true Macintosh that's smaller, lighter, and less expensive?

Outbound Systems' approach is to commandeer the ROM chips from a Mac Plus or SE you already own. The result is an impressive 9-pound battery-powered laptop that runs for three hours per charge and is actually usable on a plane, in a cab, or even in a phone booth.

What You Pay

Becoming an Outbound owner isn't quite as simple as picking one up at the local LaptopMart. First of all, you must own or buy the Mac Plus or Mac SE that's going to donate its chips. Next, you purchase the Outbound itself—about \$3000 with a floppy drive or \$4000 with a 40MB hard drive. The price includes installation by a dealer who performs the ROM surgery and gives you an Outbound lesson.

After the operation, the donor Mac only runs when it's docked, that is, when it's connected by a cable to the Outbound. When the computers are docked, their screens act like dual monitors, they share whatever peripherals are connected to the Plus or SE, and the combined memory of both machines is available. Though the solidly click-locking Mac-to-Outbound cable transfers information about ten times as fast as SCSI cables, there's still a slight delay when you open a window. Otherwise, you won't notice any difference except perhaps that the original Mac now runs at the Outbound's twice-as-fast processor speed.

What You Get

When the two computers are not docked, however, you'll remember why you endured the hardware hassle. The Outbound is indeed a small, lightweight, truly portable Macintosh. Its removable, rechargeable battery lasts about three hours on a charge, and it's automatically recharged whenever the AC adapter is connected (even when you're using the Outbound). A desk accessory that keeps track of the remaining battery time and a series of alert boxes constitute an excellent early-warning system for letting you know when you're running out of juice.

The detachable Outbound keyboard clips to the face of the CPU unit when you're traveling. It's a wireless infrared keyboard; there's something magical about typing on it and watching letters appear on the screen a couple of feet away (a keyboard cable is provided in case the magic boggles your mind too much). Instead of a mouse, you use a thin rolling cylinder called an Isopoint, located just beneath the spacebar. Slide this corrugated straw from side to side with your thumb for horizontal cursor move-

ment, logroll it up or down for vertical cursor movement, or press down on it to click. Like any substitute pointing device, it's not a mouse—for example, there's no way it will work with MacPaint. In fact, it feels sort of cheap. But it certainly doesn't consume any desk or lap space, and it generally gets the job done. (A mouse is available as an option, free if you order an Outbound by August 31.)

The Outbound's supertwist LCD display isn't a big hit with Mac perfectionists. It suffers slightly from fading-cursor syndrome when you roll the Isopoint, and you see faint rectangular shadows of open windows. But it's backlit, so you can see what you're doing in darker places (and from wider angles) than you can using the non-backlit Mac Portable. When you've set the contrast properly from the Control Panel, the Outbound screen pixels are crisp and black. To save power, you can set the backlighting to go out and the hard drive to spin down when the Outbound has been idle for a certain number of minutes.

What You Sacrifice

The Outbound is incompatible with some copy-protected software (mainly games). There's no SCSI port on the unit ("yet," says the company). There are standard modem and printer ports, but the laptop doesn't have normal Mac ADB jacks. So unless the Outbound is docked, you can't use your regular Mac's mouse or keyboard. And the Outbound keyboard lacks function keys and a numeric keypad—there's no room. Remember, too, that if you have the hard disk-equipped Outbound, you can only load files onto the laptop when it's docked to the Plus or SE; if you have the floppy drive Outbound, you can't have a hard drive. However, either model can have a silicon disk—an internal RAM disk that



MARK JOHANN

The Outbound Laptop System

preserves data even when the computer is off—of up to 16MB.

Engineering Niceties

The Outbound isn't beautiful—especially compared with the Macintosh Portable. Holding an Outbound, you become aware of the engineering necessary to cram a complete Macintosh into something the size of the Manhattan phone book. Almost every surface is occupied by the screen, the ports, a flip-out foot (to hold the CPU upright), the handle, and so on.

When you actually use the laptop, however, you realize that its internal design is quite sophisticated. For example, the Outbound uses standard camcorder batteries that can be picked up at any electronics store, and no data is lost when you change batteries—theoretically, with enough of them, you could go all day without being near an outlet. Another example: the Outbound doesn't require special memory chips like the Macintosh Portable. Both system RAM and the RAM that constitutes the silicon disk use standard SIMMs. And in the attention-to-detail department, check out the \$119 carrying case. It's one incredibly thoughtfully designed piece of luggage.

It would be safe to call the Outbound a rugged machine, designed to be toted and even operated under

bumpy conditions. But not every Outbound is perfect when it rolls off the assembly line. Fortunately, you're shielded from getting an Outbound that has, for example, a defective screen; the dealer who sells you the unit is supposed to test every Outbound and sell it only if it works perfectly. The Outbound also has a one-year parts-and-labor warranty.

Outward Bound

We may as well accept that there is no such thing as a no-compromise laptop Macintosh: if the cost doesn't get you, the size and weight will. If you want a complete self-contained computer, your choices begin with the \$5500 base-model Colby and run all the way to the \$9000, AC-power-only Dynamac. None, especially the Macintosh Portable, holds a candle to the Outbound's portability, both in terms of size (12 by 8 by 3.6 inches) and weight (9 pounds including battery). And none costs less. You could buy a floppy-drive Outbound (\$3000) and a Mac Plus (around \$1000) and still come thousands under the least-expensive alternative.

The Outbound's particular set of compromises—a couple of nonstandard ports, a nonextended keyboard, and the mutual exclusivity of a floppy or hard drive—render it a satellite computer. That is, it's an exception-

ally functional grab-and-go device that requires little fuss or thought but is best considered as the ultimate peripheral to a real Mac. Outbound Systems itself is run by very smart people who are obsessed with customer satisfaction, and they have plans for some terrific additions to the product line (such as a device that will enable your laptop to dial your post-operative Plus remotely to transfer files). Chances are good that once you try an Outbound, you'll want one—and once you have one, you'll be the happiest passenger on the plane.

—David Pogue

See Where to Buy or circle 826 on reader service card.



Desktop Publishing Program

ALDUS PAGEMAKER 4.0

Pros: Improved typographic controls; improved text editing; new linking, indexing, and table-of-contents features; new version-control features; excellent manuals and online help. **Cons:** No dialog boxes for precise element positioning or resizing; allows only one open document at a time; text rotation in 90-degree increments only; no editing of tracking or kerning tables; online help doesn't work when a dialog box is open; uses 5MB to 6MB of hard disk space; some operations are sluggish on 1MB Mac Pluses and SEs; disk errors can result in lost work. **Company:** Aldus Corporation. **Requires:** Mac Plus; hard disk. 2MB RAM recommended. **List price:** \$795.



Aldus PageMaker, long a desktop publishing favorite, has also received its share of criticism, especially from people who prefer its closest competitor, QuarkXPress. The complaints are familiar: PageMaker can't handle lengthy publications. Its minimal word processing features make it impractical to extensively edit text that you've placed. It doesn't offer precise control over word and character spacing. It doesn't allow you to rotate, stretch, or condense text. It doesn't support fractional type sizes such as 10¹/₂ points.

With PageMaker version 4.0, Aldus has addressed the aforementioned shortcomings, but without sacrificing

the program's appealing click-and-drag layout style. If you liked PageMaker before, you'll like it even more now—although you may want to upgrade your hardware to handle the program's increased girth. If you've been using QuarkXPress or Letraset's DesignStudio or ReadySetGo, you may want to give Aldus PageMaker a second look. And if you're shopping for your first publishing program, you'll find PageMaker's mix of power and simplicity hard to beat—provided your hardware can accommodate it.

Familiar Surroundings

Anyone familiar with previous versions will feel right at home with 4.0. The pasteboard—that electronic layout table upon which you place text and graphics—is identical, as are its surroundings: page-number icons line the bottom of the document window, and a toolbox of icons lets you edit text, crop graphics, and draw lines and various shapes. The menus are similar, too, although most have additional commands.

But you'll notice one big difference between PageMaker 4.0 and its predecessors before you even start the program. It uses a whopping 5MB of disk space—2MB more than version 3.0. PageMaker 4.0 has a healthier appetite for memory, too. It runs on a 1MB Mac, but slowly; 2MB is a more realistic configuration. And if you're working with long publications, compiling indexes and tables of contents, or doing extensive text editing with PageMaker, you'll probably want a 68020- or 030-based Mac.

What's the Story?

Previous versions of Aldus PageMaker seemed to ignore the fact that you often need to make last-minute edits after text is laid out. The story editor, a built-in mini-word processor, changes all that. Triple-clicking on a pasted-down text block or choosing the Edit Story command opens a window containing the text, displayed in a single font and size for fast scrolling (see "Changing Your Story"). Within the story editor, you can use PageMaker's new, 100,000-word spelling checker and its new search-and-replace commands, which also let you search for and change text attributes.

QuarkXPress and DesignStudio provide similar word processing features; indeed, DesignStudio also has a glossary for quick entry of often-used text. But only PageMaker provides a separate window for text editing, and it's a superior approach because it lets you access all the text from a given story by simply scrolling. You need not move between different pasted-up pages, for example, or scroll from the bottom of one column to the top of the next.

Better still, the story editor doesn't apply editing changes to the layout until you reactivate the layout window. And by showing all text in one font and size, the story editor makes it easier to edit tiny footnotes, tightly kerned headlines, and other text elements that are difficult to edit directly on a layout.

More Text-Tweaking Power

At last, PageMaker's basic text formatting features compare favorably to its competitors'. You can choose point size and leading values in 1/10-point increments, versus the 1/2-point increments in PageMaker 3.02. PageMaker 4.0 supports a maximum font size of 650-point, versus 3.0's 127-point limit. QuarkXPress's maximum point size is 500; DesignStudio's is 327.

Like DesignStudio and QuarkXPress 2.1 and 3.0, Aldus PageMaker 4.0 provides a tracking feature for improving the spacing of text. Unlike the tracking features in earlier versions of QuarkXPress and ReadySetGo, which simply let you increase or reduce the space between characters,

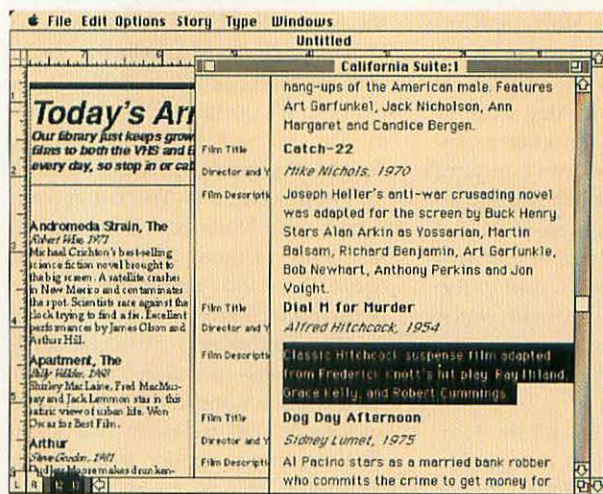
PageMaker 4.0 provides true tracking, which adjusts character spacing depending on the type size—the spacing of large sizes is altered more than that of small ones. PageMaker offers five levels of tracking, ranging from Very Loose to Very Tight. Unlike DesignStudio and QuarkXPress versions 2.1 and 3.0, PageMaker doesn't let you alter its tracking levels to suit your tastes, but that isn't a significant drawback. PageMaker's preset tracking levels yield excellent results. Between them and the program's manual-kerning features, which adjust spacing in increments as small as 1/100 em, most users will have all the control over character spacing they need.

The Paragraph dialog box provides new options that let you automatically draw rules above and below a paragraph or line and specify that certain lines be kept together on a page or in a column. And now you can rotate text, albeit only in 90-degree increments; QuarkXPress and DesignStudio allow free rotation to any angle.

You Can Make Book on It

PageMaker 4.0's unique book-production features shatter the program's reputation for being suitable only for small jobs. Publications can have up to 999 pages (versus 3.0's 128-page limit), and the new Book command lets you define a list of individual publication files that, when combined, make up a book. PageMaker numbers pages appropriately across publication files, and at printing time lets you choose between printing just the open

(continues)



Changing Your Story

The story editor lets you revise text without having to scroll around a layout. If a story uses style sheets, you can optionally display their names next to the paragraphs they apply to. You can also import word processor files into a story editor window and create new stories from scratch.

MAC RENDERMAN™

See us at
Macworld Boston
booth 658 and
Siggraph
booth 1249

Design with

- ▶ Swivel 3D Professional
- ▶ MacroMind Three - D
- ▶ StrataVision 3d
- ▶ 3DPRODUCER
- ▶ 3DMODELER

Render with MacRenderMan

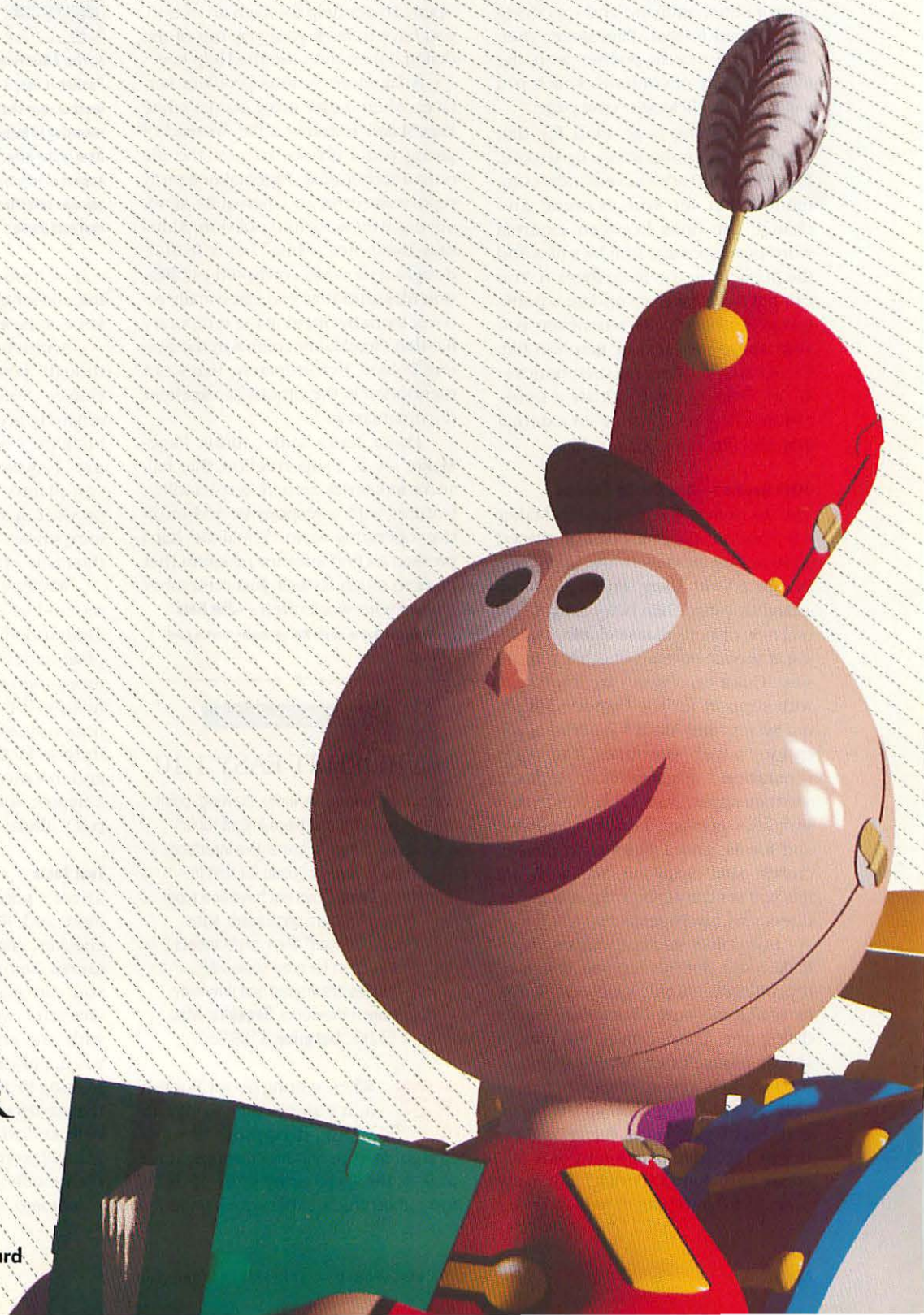
*Shrink-wrapped Magic
from Pixar!*

800 937-4927

P · I · X · A · R

Swivel 3D Professional, MacroMind Three-D, and
StrataVision 3d are trademarks of Paracomp, Inc., MacroMind,
and Strata respectively. 3DPRODUCER and 3DMODELER
are trademarks of Visual Information Development, Inc.

Circle 356 on reader service card



publication or the entire book.

Also unlike the competition, PageMaker 4.0 can generate indexes and tables of contents. You can designate index and table-of-contents entries within PageMaker, or you can import Microsoft Word 4.0 files containing existing entries. Compiling the entries is a matter of simply choosing the appropriate command and specifying the desired format. PageMaker then "loads" the mouse pointer with the index or table of contents, which you can place by clicking on the page.

For keeping large (and for that matter, small) publications up to date, PageMaker 4.0 adds several new commands that let you examine and change the links between external word processor and graphics files and the publication you place them in. You can tell PageMaker to update a publication automatically whenever you alter an original text or graphics file. DesignStudio offers no such options; QuarkXPress 3.0 can update a publication when you change an external graphics file, but not a text file.

Other Goodies—And Not-So-Goodies

The list of new features in PageMaker 4.0 goes on. Graphics can be placed so that they move with the text that's associated with them. Printing is more straightforward than before, with several new options that streamline printing at service bureaus or other remote sites. Color capabilities are improved, with support for the Pantone Matching System and Aldus's PrePrint application, which produces four-color separations. PageMaker includes a separate application, Table Editor, that simplifies creating tables, schedules, and forms. And a gateway to the Microsoft Mail electronic-mail software lets you send and receive publications directly within PageMaker.

But unlike its competitors, PageMaker still doesn't let you resize or reposition a graphic or block of text by typing measurement values into a dialog box. Those operations remain strictly mouse oriented. It's true that the mouse is a more responsive positioning and sizing tool, and it's true that PageMaker 4.0's rulers are extremely accurate positioning aids (accurate to within .0003 inch). But many users feel that typing in size and posi-

tion values provides greater precision.

Finally, a couple of quirks—one annoying, one potentially devastating. The annoyance concerns PageMaker's online help. It's a great improvement over the help systems in earlier versions, but the help key sequences (⌘-?) or the extended keyboard's Help key) don't work when a dialog box is open. To get help for such an option, you have to back your way out of the dialog boxes, then use the Help key.

A far more serious problem surfaces when a disk error occurs while PageMaker is saving a file. Instead of giving you a chance to save the file onto another disk, PageMaker simply reports the error and then quits, sending unsaved work into oblivion. Aldus says that's not a bug, but a feature designed to avoid corrupted publication files, and that you can usually recover work by opening the temporary file that PageMaker creates in the System Folder. Unfortunately, that's not mentioned in the otherwise excellent documentation.

These flaws aside, Aldus PageMaker 4.0 is a superb effort that balances industrial-strength text-handling features with a responsive and intuitive operating style. You'll be hard pressed to find another program that does so much so well. Just remember to save your work often.—Jim Heid

See Where to Buy or circle 706 on reader service card.



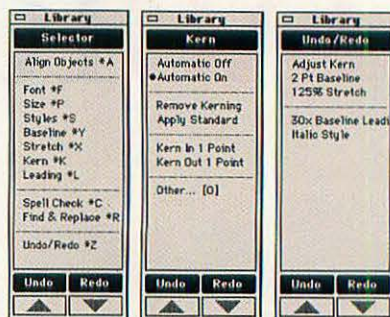
Page-Makeup Software

PUBLISH IT EASY 1.10

Pros: Inexpensive; includes drawing, painting, writing, and page-layout tools; innovative, highly interactive interface; multiple levels of undo for text formatting. **Cons:** Does not have fine typography, custom page sizes, automatic "continues" lines, style sheets, or support for gray-scale TIFF; ruler guides are limited and unwieldy. **Company:** Timeworks. **Requires:** Mac 512KE. **List price:** \$199.95.



When writing about Publish It Easy, it's always a challenge to avoid dropping into a straight feature list. Most people refer to it as the Swiss army knife of desktop publishing, and because it includes



In the Library with the Text Tool

Publish It Easy's Library palette lets you make most of your changes to text formatting without resorting to menus and dialog boxes. Click on any item in the Selector, and you can control that aspect of text formatting. Click on Undo/Redo, and you can selectively undo changes you've made in that text frame.

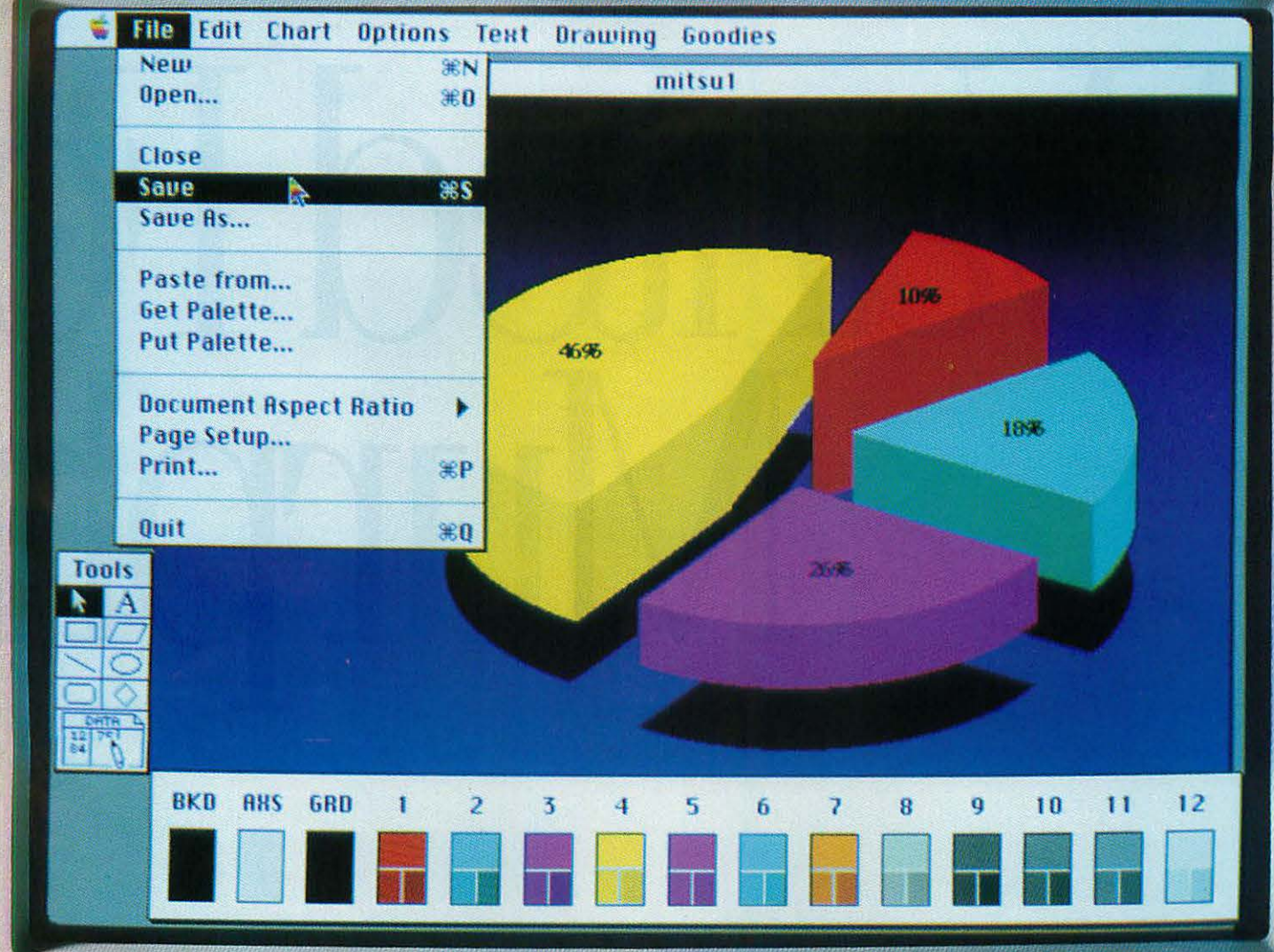
robust tools for page layout, text editing, drawing, and painting, that monitor is appropriate.

Almost in the same breath, though, people bemoan Publish It's clunky, cluttered interface. Clunkiness is hard to avoid with so many features, but it does make the program hard to use. Timeworks has addressed these complaints admirably in its latest product, a streamlined, pared-down, inexpensive version of Publish It by the name of Publish It Easy.

While removing features was one method of simplifying the program, Timeworks hasn't stripped it of its jack-of-all-trades ambience. It still has a more-than-impressive toolbox and feature list—enough to keep most nonprofessional page makers happy. Its tools for drawing, object alignment, and rotation (text or graphics, in 1-degree increments), in particular, put it ahead of some of the big guns.

Text Tools

There's good text editing, including Find and Replace, a good spelling checker, and even a thesaurus (Thesaurus Rex). With Find and Replace you can search for and replace any character, word, phrase, or type style with any combination of character, word, phrase, and type style. Text formatting includes most of the controls that casual users need, plus some nice bells and whistles like automatic and manual kerning (in full-point increments only), baseline shifts, and ex-
(continues)



You Have a Lot Invested in Savings. Ensure Your Investment With a Mitsubishi Optical Storage Subsystem.

You've invested time and money in your business records, documents and drawings. Many are irreplaceable.

The Mitsubishi® MW-5U1 optical storage subsystem ensures the safety of your files with indelible WORM optical recording. With Mitsubishi, they're safe from overwrite, inadvertent erasure and other hazards that plague traditional storage media.

The optical disk is removable. And removable media means economical, unlimited capacity and easy archiving. Each inexpensive 5¼" optical disk holds an additional 600 megabytes.

Best of all, the MW-5U1 is available as a turnkey subsystem that includes everything you need... Drive. SCSI interface. Cables. Power supply. All in a compact desktop enclosure. With software and user's manual.



You expect more from Mitsubishi Electronics, the industry leader in optical storage technology, and you get it. The MW-5U1 has the highest performance of any 5¼" optical disk system available. To ensure unparalleled quality and reliability, Mitsubishi manufactures virtually all components of the MW-5U1, including the media itself.

So protect your investment. Just plug the MW-5U1 into your Apple® computer and start saving.

For the nearest Mitsubishi reseller call 1-800-556-1234, ext. 54A in the U.S. and Canada (in California, 1-800-441-2345, ext. 54A).



Mitsubishi Electronics America, Inc., Information Systems Division, 991 Knox Street, Torrance, CA 90502.
Mitsubishi Electric Sales Canada, Inc., 8885 Woodbine Avenue, Ontario L3R 5G1.

© 1989 Mitsubishi Electronics America, Inc. Mitsubishi is a registered trademark of Mitsubishi Electric Corp., Tokyo. Apple is a registered trademark of Apple Computer, Inc. Image courtesy of Visual Business Systems, Inc.

Circle 52 on reader service card

Wanted For Murphy

According to Murphy's Law, if a floppy disk can fail, it will. Usually after you put a 90-page document on it.

That's why you should use 3M diskettes. They're built to make things go right for a change. With our

exclusive formulation and Mark Q Manufacturing Process, they break Murphy's Law millions of times a day. Year in and year out.

And our engineers have taken the same fanatic approach with all our

Breaking Murphy's Law.



data storage products: diskettes, data cartridge tapes, computer tapes and optical disks. So when you get

down to it, there are only two choices.

Use 3M diskettes and break Murphy's Law every day of the week. Or use something else. And give Murphy's Law a chance to break you.

For more information about diskettes, call 1-800-888-1889, ext. 10.

Circle 402 on reader service card

3M

panded or condensed type (1 percent increments). There are import filters for MacWrite, Microsoft Word (3 and 4), WordPerfect for the Macintosh, WriteNow, and even Excel. Hyphenation is a batch, rather than an interactive, process—select the text and use the Insert Hyphens command—but it's speedy and pretty smart.

Publish It Easy imports all the standard graphics files, with the notable exception of gray-scale TIFF. It only offers seven standard colors, and even though you can print to a color printer, don't expect spot color overlays; printing is basic and limited.

Innovative Interface

The most important changes aren't really in what's been left out; they're in the interface. More than anything, Easy stands out for its interactivity. It's great for casual users, who often find themselves trying things out on the page, rather than plotting everything in advance. As you resize a text frame, for instance, the text reflows inside the frame; it doesn't wait for you to release the mouse button. Most dialog boxes let you see the results of your changes before you click on OK to close the box.

The text library is perhaps Publish It Easy's most innovative feature. You can adjust almost every text-formatting command—font, size, leading, kerning—by selecting it in the library. Change your mind? Just click on Undo/Redo to get a list of your changes to that frame's text so you can choose which to undo or redo. The feature is not entirely selective, though; if you undo the second-to-last change, for

instance, you also undo the last one. When you come back to that frame later, the Undo/Redo list is still there.

Seeing What You Do

Easy is one of the few page-makeup programs that actually lets you see objects move as you drag them around on the page. This is one of PageMaker's great strengths, and while Easy isn't as fluid as PageMaker for moving objects—there's some halting jerkiness—it is smooth enough to be usable, except when dragging gray-scale PICTs. Bear in mind, though, that you'll need 2MB or more (or a stripped-down System) to make this effective. Under MultiFinder, at least, with the 683K that's recommended, Publish It Easy is constantly rebuilding the whole page as you move items.

Few Failings

So what's wrong with Easy? Not a whole lot, especially considering the low (and heavily discounted) price. There are limitations—like its restriction to integral point sizes—that aren't a great problem for general business users, but some other things are more than annoying. The ruler guides (one horizontal and one vertical per document) are just as clunky and unusable as its older brother Publish It's. You can't create custom page sizes; you're limited to the standard sizes offered in the printing dialog box. There are no "continues" lines and no style sheets.

One problem that cropped up in early versions of Publish It seems to be rearing its head in Easy—text selection and cursor positioning. The cursor often appears in the wrong place, and it behaves idiosyncratically when you use cursor-movement keys together with the Shift key.

Easy is also a bit slow in some operations (such as text selection), but, surprisingly, most operations aren't a whole lot slower on a Mac Plus than on a II (hyphenation and other batch operations are notable exceptions). Easy runs well on Pluses and SEs, and the application itself weighs in at less than 290K on disk.

The problems with Publish It Easy are more annoyances than fatal flaws. Easy is a heck of a lot of page-layout program for a heck of a price. It's a

much better value than Springboard Publisher, at the same price, and it remains to be seen how it will compare with Silicon Beach's soon-to-be-released Personal Press. Easy's files are compatible with the full-blown version of Publish It, which is slated for an upgrade in the late fall. So there's even an upgrade path if you start with Easy and find it doesn't meet all your needs.—**Steve Roth**

See Where to Buy or circle 833 on reader service card.

Word Processing Application

WRITENOW 2.2

Pros: Compact; fast; nearly bug free; extremely intuitive. **Cons:** No style sheets or endnotes; text can't wrap around graphics. **Company:** T/Maker Company. **Requires:** Mac 512K. Second disk drive recommended. **List price:** \$199.



WriteNow is generally considered a low-end word processor. True, it lacks many of the features of its bigger (and more expensive) cousins, but with WriteNow 2.2 the low end has gotten pretty high. Ever since version 2.0, WriteNow has had an impressive list of features: virtually no limit to the number of windows you can have open, the ability to handle documents of 1000 or more pages comfortably, the ability to import and export documents in many different formats, automatic paginated WYSIWYG editing of documents with one to four columns, automatically numbered footnotes, multiple headers and footers, mail merge, word counting, smart quotes, smart cut and paste, an extensive spelling checker, flexible formatting, and versatile graphics support.

Version 2.2 adds to these capabilities with a font menu that displays each font name in its own face; improved menu organization; a number of new ⌘-key equivalents for menu items, ruler choices, and dialog box buttons; the ability to copy and paste styles; the ability to directly import files created by Microsoft Write and Microsoft Word 3.0 and 4.0 (even files saved using Word's Fast Save option); a spelling (continues)



Power Palettes

You'll find plenty of palettes in Publish It Easy, including a choice of vertical or horizontal toolboxes. You can shrink or enlarge them with the zoom boxes, and turn them on and off selectively.



“What’s in a name?”

Everything, If You're in the



Don't Confuse Us with Anyone Else. The Name is Microtech International.

In 1985, Microtech International introduced the first 800K floppy drive for the Macintosh®. Since then, we've sold over \$100,000,000 of Macintosh mass storage and memory products worldwide, while continuing to offer the latest in proven technology with the ultimate in quality and customer support.

MacUser Labs **★★★★** rated Hard Drives

Whether money is no object or every penny counts, Microtech makes the right hard drive for every need and budget.

Our *new Europa™* Series, built for economy without sacrificing quality, features capacities from 20 to 100MB.

Powerful and sleek, our *new Athena™* 50 and 100MB drives are among the most compact on the market.

The award-winning Nova™ Series includes MacUser Labs **★★★★** rated 40 and 80MB drives ("Best of 101 Hard Drives," Feb. 1990) and has been expanded to include *new*, higher performance models with capacities up to 1.2 Gigabytes.

Both the Nova Series and the new Athena drives are warranted for a full five years.*

Why the Most Experienced Customers Love Microtech International

It's a fact. The more you know about mass storage and memory, the more likely you are to buy from Microtech. In fact, 85% of the Fortune 500® companies use our products.

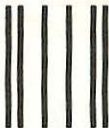
Experienced users, like Jack Vees, Operations Director of Yale University's Center for Studies in Music Technology, give our equipment top ratings for quality, reliability and performance. "Microtech has very reliable products and outstanding customer

SAVE

ALMOST

50%

SEE
BACK



NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
Subscription Department
P.O. Box 51666
Boulder, Colorado 80321-1666



SAVE
\$23⁴⁰
*off the
cover
price*

12 Issues for \$24!
When you subscribe today

☐ Send me 1 year (12 monthly issues) of
MACWORLD for \$24. Save 20% off the basic
subscription rate.

☐ **SAVE EVEN MORE!** 2 years (24 monthly issues)
for \$37.90.

Please Bill me later.

4ATB7

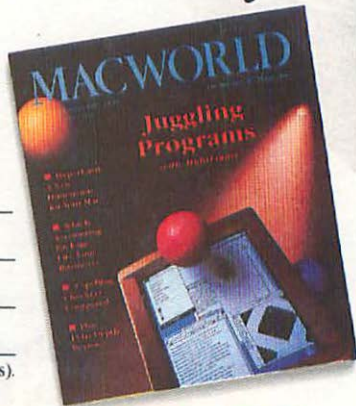
Name _____

Company _____

Address _____

City/State/Zip _____

By regular subscription, **MACWORLD** is \$30 for 12 issues. The annual cover price is \$47.40 (12 issues).
Offer available to subscribers in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.



MACWORLD

The Macintosh® Magazine

Market for Mass Storage.



support. It's an uncommon pleasure to deal with a company like Microtech International."

Users also appreciate the fact that nearly all our drives come with free Norton Utilities® and Total Recall™ software and that Microtech's service includes MicroLink™, our free 24-hour bulletin board. Additionally, Microtech users benefit from our toll free support, backed by a well-trained and easily accessible staff. In the unlikely event there's a problem we can't solve over the phone, we'll fix your product and ship it back to you within 48 hours.

Microtech's exclusive Step-Up™ Expansion program allows you to keep up with advances in technology through trade-in rebates or discounts on your upgrade purchases.

Removable Drives — Reliable Choices

Unlike other companies, Microtech offers you a choice of top rated removables, from

the new, economical Europa 45R to the "nearly indestructible" Microtech R50.

Both models offer the advantages of transportability, unlimited storage and come with a free cartridge.

Optical / CD-ROM Drives

Beyond magnetic storage, optical technology provides the benefits of prolonged data integrity in a compact, high capacity medium. Ideal for applications such as DTP, CAD/CAM, and multimedia production, the Microtech OR650 rewritable optical drive offers a "leading combination of price and performance" (*Macworld*, March 1990).

With the fastest access time available in CD-ROM technology, the new CD600 is the right choice for electronic reference resources, developer tools, system software, multimedia and countless other applications.

What's in a name? More than you thought.

A Passion for Quality

A lot of companies pay lip service to quality, but Microtech delivers it in every product we sell. We never buy cheap parts because, in the long run, they're too expensive. And with a staff of over 25 employees assigned exclusively to quality control and customer support, it should come

as no surprise that Microtech boasts the industry's longest warranties and lowest failure rates.

Tape Backup — "Standouts" (Macworld, Dec. 1989)

While everyone knows the importance of backup, most backup systems are just too difficult and time consuming. Microtech systems are easy to use and provide for fast protection of your valuable data.

Our T150 Tape Backup System was identified as a "standout" by *Macworld* magazine. And for larger capacity needs, Microtech now offers the *new* T1200 Digital Audio Tape unit with 1200MB of storage.

Both the T150 and T1200 come with Total Recall software, that handles a wide range of backup functions, even backing up an entire network, automatically and unattended.

Memory — Macworld Best Seller List

Microtech is one of the world's leading suppliers of memory. In fact, we ship more memory, in more configurations, than our three nearest competitors combined.

In today's volatile memory marketplace, whether you're looking for 2MB for a Plus® or 32MB for your IIfx®, you can count on Microtech memory products to be competitively priced, immediately available and warranted for a full five years*.

Quality and Support Worldwide

Whether you purchase Microtech products in the U.S.A. or from one of our international distributors, you'll always receive the same high quality products. Our worldwide network of authorized service centers ensures responsive customer support — guaranteed.

Microtech International, Inc.

Headquarters:
East Haven, CT, USA
San Francisco, CA, USA
Europe
Japan
Hong Kong



For more information or the name of your nearest dealer, call us Today:

1-800-325-1895

For international sales information, please call:

203/468-6223 or fax: 203/467-8124.



MICROTECH
INTERNATIONAL, INC.
158 Commerce Street, East Haven, Connecticut USA 06512

Macintosh, Plus and IIfx are registered trademarks of Apple Computer, Inc. Step-Up, Nova, MicroLink, Europa and Athena are trademarks of Microtech International, Inc. Norton Utilities is a registered trademark of Peter Norton Computing, Inc. Total Recall is a trademark of Centa Systems, Inc.

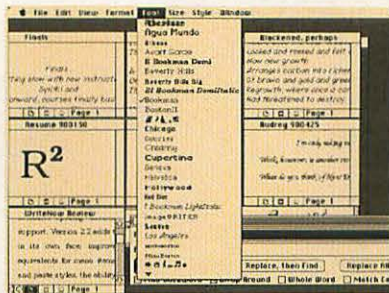
*The five year warranty is offered on hard disk drives and SIMMs sold, delivered and used in the U.S. or Canada. Certain restrictions and exclusions apply. Terms and conditions of the 5 year warranty are available upon request. ©1990 Microtech reserves the right to change specifications without notice.

dictionary expanded to 135,000 words; a WriteNow-only version of Proximity's 1.4-million-word WordMaster thesaurus (including short definitions); ruler guides (vertical lines that help align tab stops); window cleanup that supports a variety of stacking and tiling options; and support for the extended keyboard. WriteNow 2.2 also remembers the size and location of a document's window, and new icons in the window frame make it easier to switch between document, header or footer, and footnote views.

Good versus Great

The difference between a good word processor and a great word processor isn't just the litany of features, it's how well those features work for you. A great word processing application doesn't send you scrambling to the manual or online help for basic operations, or make you navigate dialog boxes or ⌘-key sequences when a single menu selection or keystroke should do, nor does it make you wait for operations you perform regularly. Though I own nearly all of the word processing programs available for the Mac, I rely on WriteNow far more than all the others. Most of the features I need are there. And when all I want is to type a term paper or a quick letter, WriteNow doesn't get in my way.

WriteNow carries out critical functions blindingly fast (and it keeps up with the fastest typing, too). The 80,000-word spelling checker checks even large documents in seconds. It remembers which words have already been checked (so rechecking a document after editing is practically instantaneous), and it can learn or forget a selection of words, which is great for maintaining custom dictionaries. Saving a document is particularly fast (a boon for paranoids like me), and Undo is also rapid. Undo seems to always be there when I need it, and it does (undoes?) what I expect it to. In addition to providing Undo, WriteNow lets you revert to the previously saved version or to the version before that (and, yes, you can undo the reversion). WriteNow is lean (it runs on a 512K Mac with two floppy drives or under MultiFinder with only a megabyte of memory), reliable, and above all, consistent.



Tiling Windows

WriteNow 2.2 adds the ability to overlay, stack, or tile windows in a variety of different styles; and the font menu displays each font family in its own face.

Does It or Doesn't It

WriteNow does what it does extremely well. Its main failings lie in what it doesn't do. Graphic images, for example, are treated just like characters within a line. You can resize them, move them vertically in 1-point increments within a line, or move them anywhere horizontally, but you cannot have more than one line of text adjacent to a graphic. In other words, WriteNow doesn't wrap text around graphics. Nor does it support margin lines or boxes around text. (Version 2.2 includes the handy booklet *Using WriteNow: Handbook of Tips & Techniques* [T/Maker Company, 1990], which contains clever, if not particularly Mac-like, workarounds for these graphics limitations.) Complex graphics tend to slow scrolling to a crawl, though a Hide Pictures command displays graphics as fast-scrolling gray rectangles. WriteNow 2.2 also lacks integrated outlining capability and cannot create endnotes. It doesn't support double underlining, strikethrough text, or automatic line numbering, and it doesn't have table-generation features or style sheets (though copy and paste style helps here).

WriteNow achieves its rapid pagination at a price. The space reserved for the header and footer is equal to the tallest header or footer in the entire document plus an additional amount determined by the page wrap factor, an obscure number that can be set from the Page Setup dialog box. If you have unusual formatting requirements, WriteNow's pagination scheme can get in the way. Column support is also limited—you select one to four columns, but the selection applies to

the entire document, and all the columns must be the same width.

Though most of what WriteNow does is intuitive, a few functions are hidden. WriteNow can apply a font, size, or style change to all the text in a document that matches a certain style, but you would not know how to do it without reading the manual. (Use the Shift key while selecting the new style.) There is no online help.

Bugs are almost nonexistent. WriteNow 2.2 did introduce a conflict with Stepping Out II version 2.02 when not running under MultiFinder. There also can be a problem with printing multiple documents from the Finder: WriteNow will print only as many pages as there are in the first document selected (documents print out in alphabetical order of their file names). So if you're printing out the chapters of a manuscript and chapter one has only 10 pages but subsequent chapters are longer, WriteNow prints only the first 10 pages. To work around this problem you should give your chapters new file names alphabetized in descending order of size. (T/Maker is aware of the problem and will fix it in the next version.) Otherwise, WriteNow 2.2 is rock solid.

This was definitely the toughest review I've ever written. Before writing this, I had never fully realized just how much I like WriteNow. I have much more difficulty finding the bad points of a program I really like than I have had searching for good things in programs I don't care for. WriteNow 2.2 is simply the fastest, friendliest, most trouble-free word processing application I have ever used.

I've generated serious documents with MacWrite, Microsoft Word, WordMaker, FullWrite Professional, TeXtroff, WordPerfect, WordStar, and others. They all have features I'd like to have that are missing from WriteNow. But I noticed all of them—while I hardly noticed WriteNow at all before this review, though I've used it a lot more than any of the others. That's the highest praise I can give any word processing application. I even composed a 96-page book with WriteNow, and it looks as though the publisher might go to film directly from the file.—Ron Risley

See Where to Buy or circle 874 on reader service card.



File Edit View Special



My Disk



Sony NEWS Server



Trash

Click here for power.

Let's take a moment to fantasize.

Imagine administration software that lets you add, modify and delete users, groups and volumes on your Macintosh® network. Imagine being able to backup local drives to the server. And publishing usage reports to monitor network activity and troubleshoot bottlenecks. And electronic mail that connects with any UNIX® e-mail system. And a dual-processor architecture server, designed for intensive disk operations and demanding I/O processing.

All available at the click of a mouse.

Now let's talk fulfillment: uShare Plus™ software on the Sony NEWS® fileserver. It offers all the above and more—installed, configured and administered from the comfort of your Macintosh environment. Fully AFP compliant, so all existing applications run without modification.

Click for yourself and find out. Call 1-800-624-8999, ext. 96, to arrange a demo.



SONY®

Sony Microsystems Company

Sony Microsystems Company, 651 River Oaks Parkway, San Jose, CA 95134, (408) 434-6644 FAX: (408) 954-0849 • Sony of Canada, Ltd., Ontario, Phone: (416) 499-1414 FAX: (416) 497-1774
Sony Microsystems Europe, Köln, Phone: (0221) 59 30 42 FAX: (0221) 59 35 42 • Sony (Australia) Pty. Ltd., N.S.W., Phone: (02) 887-6666 FAX: (02) 887-4351 • International Sales Division, Tokyo, Phone: (03) 448-4041 FAX: (03) 448-4043
Sony and NEWS are trademarks of Sony. uShare Plus is a trademark of Information Presentation Technologies, Inc. Macintosh and the Apple logo are registered trademarks of Apple Computer Inc. UNIX is a trademark of AT&T.
© 1990 Sony Corporation of America.

Circle 133 on reader service card

★
High-Capacity Erasable Optical DriveMACINSTOR
ERASABLE OPTICAL

Pros: 53 percent more capacity than ANSI-standard 650MB systems; uses ANSI-standard cartridges; respectable selection of bundled disk-management software. **Cons:** Performance in ANSI mode is slow. **Company:** Storage Dimensions. **Requires:** Mac SE. **List price:** \$7995 (includes one formatted 1GB cartridge); additional cartridges \$395.

What's made in America, has 50 percent more interior room than any Japanese model, runs on either high-octane or regular, drag races past the competition, and features a price tag to match? One answer is the Cadillac of erasable opticals, the MacinStor Erasable Optical (EO) from Storage Dimensions.

Earlier this year *Macworld* reviewed erasable optical drives; all were Sony or Ricoh drive mechanisms with varying degrees of value added by American vendors (see "Erasable Optical: New Light on Data," March 1990). The MacinStor EO, featuring a drive mechanism produced by Storage Dimensions' parent company Maxtor, offers some unique features that make it stand out from the clones.

Extras

The MacinStor EO is conceptually similar to its competitors; all use a magneto-optical mechanism in which a sharply focused laser heats tiny spots for writing magnetic data, and another laser reads the data spots by examining polarized light reflecting off of them. This complicated scheme helps explain why these drives are expensive. In addition, the System regards each side as a separate volume. You have to eject the cartridge and turn it over to use the other side.

The MacinStor EO, however, can use a proprietary high-capacity cartridge (the so-called Tahiti format) in which each side has a final usable capacity of 442 megabytes. This is a bit more than 50 percent larger than the 287MB capacity typically offered by the ISO-ANSI 650 standard. The MacinStor EO needs no physical or software

modification to read 650-style cartridges, although you would normally take advantage of this capability only if you need to transfer data from drives that require standard cartridges. There's a read-write throughput slowdown of approximately 30 percent for ANSI cartridges.

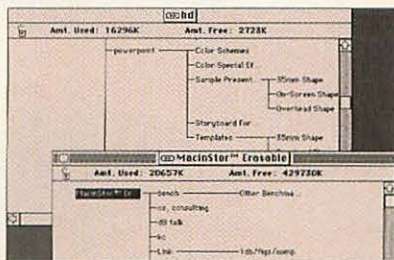
Wide Open Spaces

Since the MacinStor drive comes with one preformatted cartridge, setup is effortless—you connect the drive, drag the MacinStor cdev into the System Folder, and restart. The first side of the cartridge now appears as a 442MB hard drive on the desktop. To manage these wide-open spaces, Storage Dimensions bundles Central Point Software's PC Tools Deluxe (an upgraded package, to be called Mac Tools Deluxe, should be out by the time you see this). A particularly helpful utility is Mirror/Rebuild, which stores directory information in special files that allow you to recover data in the event of a crash.

Data protection and crash insurance are, of course, crucial for storage systems of this size—if you worry about a modest 20MB hard disk failing, think about rebuilding half a gigabyte. At these prices, disk-management utilities must be adequate to the task, and it's comforting to see that Storage Dimensions takes this seriously.

A Matter of Time

MacinStor EO's capacity is certainly nice to have, but your purchasing decision is also likely to depend on speed. I ran the same benchmark on the MacinStor EO that I used in the

**Forest for the Tree**

One part of the Mac Tools utility in PC Tools Deluxe lets you toggle between tree and catalog listings of the disk's contents. Other utilities for backup and protection from data loss are also included.

March EO drive article; in four out of five tests the MacinStor EO is the fastest erasable optical now on the market.

On basic SCSI parameters, the MacinStor EO shows a faster read time than any other drive except the Pinnacle REO-650 equipped with an additional Opti-Cache SCSI accelerator; but the write time is comparable to that of an average Sony drive. In real-world tests, this combination gives the MacinStor first place in opening large PageMaker, Excel, and Illustrator files; another first in carrying out a search in 4th Dimension; but leaves the drive down in the lower half of the pack on copying 20MB of files from a hard disk. When the drive uses ANSI-650 cartridges instead of Storage Dimensions' high-capacity cartridges, however, the performance advantage diminishes.

Spin Control

The MacinStor EO is big, and it's fast, and it costs about \$200 more than plain ANSI-650 erasable opticals (other manufacturers have recently announced 1GB opticals above and below the MacinStor's price). If you want the drive for a desktop application—storage and manipulation of color graphics, for example—speed and size are an important asset. If you are using erasable optical cartridges for interdepartment or interoffice data transfers, the MacinStor's size is again helpful, as you get the equivalent of three standard EO sides on a single cartridge. All in all, Storage Dimensions has done an impressive job of making an expensive product that's worth the money. —Charles Seiter

See Where to Buy or circle 783 on reader service card.



MacinStor Erasable Optical from Storage Dimensions

Writing unlimited.



The freedom to write and think is for all of us. Now, there is a new word processor that's just **right** for us, too. It's called MacWrite® II, and it's made by Claris. MacWrite II makes it possible **to** share your ideas and thoughts with other computers and word processors. You'll be **free** to open documents from over 50 word processors, on all kinds of computers, with all kinds of **speech**, and work on them without reformatting.

But there's more you can do. (The feature **is** called XTND.) You can import graphics, not **only** from Macs, but many computers, **guaranteed**. And you can scale and crop them, **one** and all, in your MacWrite II document. In short, MacWrite II with XTND is a powerful **word processor** that lets you freely exchange text and graphics. You'll find also that your MacWrite II **lets** you change fonts, styles, sizes and colors, as well as text with its find/change feature. And **you** can create custom styles and save them as stationery — with all formats preset. You'll **share** your reports and letters quickly.

But what good is freedom of expression if you find **your** editing to be a hassle? That's why the page layout and editing is fully WYSIWYG: the **thoughts** you see are the thoughts you get. This WYSIWYG feature, by the way, is found only **with** MacWrite II. **It's** another way Claris simplifies word processing for you, whether you're **52**, 22, or 72.

Called upon daily MacWrite II smooths your writing assignments and **other** chores. There's **MacWrite II** spell checking, for example, and foreign dictionary **programs** that are optional, **and** a host of other features that come standard. (Like a thesaurus, and a mail merge feature **you'll** discover saves lots of time.)

What it adds up to, you'll **find**, is a simple and powerful tool designed for people. All the people. It is for writers, and **it** is for business people. And it is for those of us in between. The freedom to write is **liberating**. Now technology is, too.

CLARIS®

★
Grammar Checkers

CORRECT GRAMMAR FOR THE MACINTOSH 1.0.1

Pros: Works with wide variety of word processor formats; can find errors in complex sentences; facilitates interactive editing. **Cons:** Makes suggestions that would make good sentences ungrammatical. **Company:** Lifetree Software. **Requires:** Mac Plus; hard disk. **List price:** \$79.

GRAMMATIK MAC 1.0

Pros: Offers several editing options, including interactive and offline. **Cons:** Small font in interactive Edit Window; misses many errors, especially in complex sentences. **Company:** Reference Software International. **Requires:** Mac Plus; second disk drive. Hard disk recommended. **List price:** \$99.

RIGHTWRITER FOR THE MAC 3.1

Pros: Requires only 512K of memory. **Cons:** Catches few grammatical errors. **Company:** RightSoft. **Requires:** Mac 512K. **List price:** \$95.



Just how good a job can an automated grammar and style checker do? Three companies have introduced programs that are intended to help Macintosh users improve their writing. All three programs claim to find grammatical errors and flag stylistic problems, all deliver a statistical analysis of the text and offer writing tips, all can read plain ASCII (or text) files, and all were previously available in DOS versions. Each, however, takes a slightly different approach.

Correct Grammar

Correct Grammar for the Macintosh checks the spelling and grammar of documents created on a wide variety of word processors, including Word 4.0, MacWrite II, and WordPerfect. When you start the program, a dialog box prompts you to choose which word processing file to open, and the

program immediately begins checking the selected document. Your text is displayed in one window, warnings and advice in another.

A row of buttons between the two windows lets you perform various functions or access more information (see "Correct Grammar Screen"). In many cases you can correct a problem with the click of a button, but you may want to move the cursor to the Edit Window to make additional changes. The text in Correct Grammar's Edit Window appears one paragraph at a time in 12-point Geneva, making it easy to read and edit. You can skip a problem, use the Quiet button to turn off a grammar question by clicking on Tutorial. If you previously checked the appropriate menu options, Correct Grammar automatically saves a backup copy of your original document and produces a readability analysis of your text. You can customize Correct Grammar by turning off and on grammar and style rules and by changing the readability parameters.

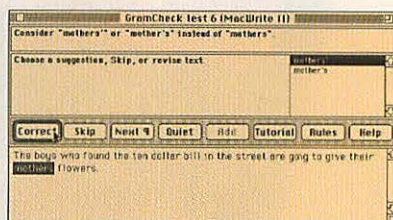
Correct Grammar claims to be 95 percent accurate, but I found that figure to be misleading. I used all three programs on text that was doctored for an editing course—an admittedly tough test—and on a half page of simple ungrammatical sentences. Correct Grammar identified some of the trickier problems that the other programs missed, but it ignored plenty of others and suggested "corrections" that would have made sentences incorrect. For example, it flagged the noun *aide* in the appropriate context, suggesting that the verb *aid* was needed, but ignored *aid* used improperly. It also flagged several subject-verb agreement problems when the words were neither subjects nor verbs.

Grammatik

Grammatik Mac, which supports a shorter list of word processors, uses bundled utilities to convert files into a form it can read. (The new version will offer a much wider variety of word processors.) Like Correct Grammar, Grammatik can be customized for different writing styles, and specific rules can be turned off. You start the program by clicking on the icon for a preference file that you have set up with

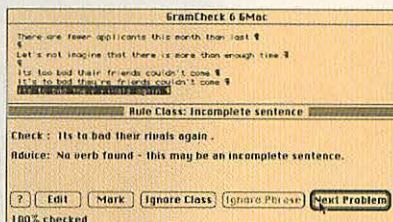
the options you want, including word processor format and appropriate writing style for your intended audience. On-screen buttons prompt you to open a file and designate a different file name for saving the revised text.

Grammatik offers several methods for copy editing (referred to throughout as proofreading). You can examine grammar, style, and spelling interactively, or you can produce marked-up copy, with or without explanatory notes added to the text, and (continues)



Correct Grammar Screen

Correct Grammar identified a verb agreement problem in this sentence and suggested changing *is* to *are*. The program does not seem to recognize indirect objects. Here, it prompts the user to make the indirect object *mother* possessive.



Grammatik Screen

Grammatik correctly suggested changing *fewer* to *less* in the top sentence. The program recognizes that something is not right with the bottom sentence, but it found no errors in the two preceding sentences.



RightWriter Marked-Up Copy

RightWriter missed most of the errors in these sentences, displayed in MacWrite II. When you are finished editing, you can go back to RightWriter and have it delete all of its comments from the document.

For a limited time, the B and A in BASF stand for Bon Appetit.



A good appetite will come in handy with BASF's "Wine and Dine" Game. Because every time you buy BASF diskettes, you could win prizes you can really sink your teeth into.



You could be one of the Grand Prize winners who'll enjoy an all-expenses-paid trip for two to the restaurant of your choice, anywhere in the U.S. It includes all transportation, meals and hotel for 6 nights. Or one of the thousands of 2nd Prize winners who'll dine in style with an American Express "Be My Guest" Restaurant Certificate worth \$100.00. There's even a second-chance drawing for a 3-day, 2-night mini-vacation. Look for game tickets in specially marked packages.

At BASF, we believe in satisfying your appetite. For the best in data protection. And the best in exquisite dining. Offer for limited time only. Call your BASF dealer today.

Try it. Depend on it.  **BASF**

return to your word processor to edit or print it. In the interactive mode, text is displayed in the upper window and advice and function buttons in the lower window (see "Grammatik Screen"). With some problems, you have the option of replacing a word or phrase with one suggested by the program. You can also ignore a phrase or class of problem for the rest of the session or skip to the next problem. A question button takes you to the program's grammar and style rules.

You can also activate the Edit Window and make your own changes. The program provides access to about two half-screen windows of text in the 9-point Monaco font, which can be murder on the eyes and difficult to highlight precisely with the I-beam cursor. When the session is finished, Grammatik displays a readability analysis that includes charts comparing your text to three standard works.

Whether or not Grammatik manages to catch complex problems, such as verb agreement, depends on the construction of the sentence. It identified the error in the sentence "The boys, who found a ten dollar bill in the street, is buying their mothers flowers." But take away the commas to make the *who* clause restrictive, and Grammatik sees no error. Also, the program sometimes recognizes that *its* or *it's* has been used incorrectly, but other times it lets the mistake slide.

RightWriter

RightWriter is a noninteractive program that produces a marked-up copy of your text. The comments that intersperse the marked-up text are coded (see "RightWriter Marked-Up Copy"), and if you want more of an explanation you can look up the code in the manual. Following the marked-up text is a readability analysis that features a list of words that may be problematic, for example, sexist language, possible jargon, and negative vocabulary. *Accident*, *demanding*, *protest*, and *fault* are only a few of the many words that the program flags as negative. Fortunately, RightWriter's dictionary, the list of words the program will flag and identify as problems, can be modified, but the process involves importing lists of words from a text file. When it came to spotting actual grammatical errors,

RightWriter was the weakest of the three programs.

Which, If Any, to Buy?

As style checkers, these and similar programs can be useful for pointing out weaknesses in your writing, such as too much use of the passive voice or too many long sentences. As grammar checkers they can help you catch some errors, but you have to wade through repetitive warnings, look for the problems the program missed, and know enough about grammar to identify erroneous corrections. If you can live with the shortcomings inherent in the current generation of Macintosh grammar checkers, consider the features that distinguish one program from another.

Interactive editing is easier with Correct Grammar, which offers larger print, the ability to work forward as well as backward in each paragraph, and the chance to go back and check any changes you've made in a sentence. Grammatik offers more flexibility for people who want the choice of editing interactively within the program, or in their word processor, or on paper. RightWriter requires only 512K of memory, and the all-caps advice that it inserts into the text is easier to find than Grammatik's mostly lowercase notes. —Gerry Lukos

See Where to Buy or circle 748 (Grammatik Mac), 842 (RightWriter for the Mac) on reader service card.

Button-Creation Software

ICON-IT 2.0

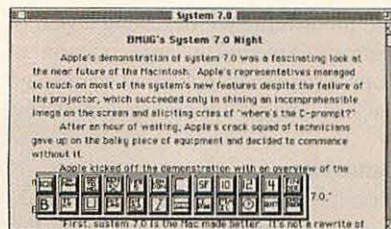
Pros: Easy to customize appearance and function of icons; works well with macros; offers wide range of prefab icon bars.

Cons: Creates barrier on the screen; shape of icon bars limited; lacks drawing tools.

Company: Tactic Software. **Requires:** Mac 512K. **List price:** Version 2.1 \$89.



If you'd like to customize your Mac's interface but are unwilling to brave the complexities and hazards of ResEdit, you may find that Icon-It 2.0 (formerly published by Olduvai) can create functional icons much more easily. For instance, this INIT can overlay icons with functions onto applications—unlike ResEdit,



My-cons

My icon bar for Word 4.0 includes many font and style commands as well as access to DAs and macros.

which requires programming to add icons with functions to applications. However, Icon-It's icons have some idiosyncrasies that leave their own stamp on the Macintosh interface.

Icon Buttons

Icon-It's icons are really buttons that appear on screen either solo or as a part of an icon bar. You can create your own bar of icons and customize each icon's function and appearance, or you can take advantage of preset, application-specific functions found in the more than 100 templates that come with the program.

Selecting Icon-It from the Apple menu makes the Icon Bar editor appear. With the Icon Bar editor you can open up one of the templates and install or remove a bar. Once you've selected a bar, you can use the editor to set its shape and position, and to orient it vertically or horizontally.

Version 2.0 adds the handy ability to create vertical icon bars, but they are still limited to a rectangle shape instead of shapes that would be more useful on a small screen—such as a pattern that would fit into a corner.

One idiosyncrasy is that if you drag a window over an icon bar, the window disappears where the icon bar and the window overlap. The unlucky window that gets its title bar or close box dragged behind an icon bar can only be moved or closed by holding down the Option key as you click or drag.

The functions provided by the icon-bar templates are mostly menu commands. For instance, the Full Template for Microsoft Word 4.0 includes buttons for saving, printing, getting a ruler, and quitting. While these functions may save a few steps, (continues)

the inconvenience of having a wall of buttons covering a large portion of your screen may make you want to go back to doing it the old-fashioned way.

Customizing

Icon-It becomes more useful when you begin customizing bars and icons. For instance, if you often change between fonts and styles, you will find Icon-It's on-screen buttons easier to use than menus or command keys. Customizing icons to perform a single menu command is as easy as opening up the Icon Function editor and selecting that function from a menu. Once you have assigned a function to an icon, you can use the Icon Function editor to doctor its appearance. While this editor lacks some tools that might be useful (invert, graphics rotation, text entry, and marquee) its FatBits canvas is adequate for creating small images quickly. In addition, images for icons can be pasted in from paint programs (though getting the icon images to be the correct size is a bit tricky).

Creating Icons from Scratch

Just as customizing buttons for specific functions makes Icon-It more useful, creating icon bars from scratch makes it more convenient. When you start with a blank icon bar you can set the height and width of your buttons, so you can reduce them to a very small size and make the icon bar less of an obstacle on screen.

Icon-It is especially useful when used to activate macros. With buttons that indicate the function of the macro being activated, even the most complex macro can be made intuitive and simple. Icon-It can activate Tempo, QuicKeys, MacroMaker, Excel, and Automac III macros.

Unfortunately, the new online help system adds little to Icon-It's rather skimpy user manual, providing only a short description of the functions of the buttons and fields in the Icon Bar editor and the Icon Function editor.

But overall, despite its quirks and inconveniences, Icon-It will probably be a permanent addition to my Finder and to my favorite applications. And it certainly is a stepping stone along the way to ultimate customization.

—Jonathan Cassell

See Where to Buy or circle 780 on reader service card.

Puzzle Game

JIGSAW 1.0

Pros: Many levels of play available; makes new puzzles from imported paint and PICT files. **Cons:** No interesting puzzle-piece shapes; gray-scale graphics are fairly dull.

Company: Britannica Software.

Requires: Mac 512K. **List price:** \$39.95.



Sure, we all know the Mac is a tool not a toy, and yet one of the things that Mac programmers are particularly good at is devising games. There are by now countless ways to divert yourself from that project budget you were plugging in to a spreadsheet, the sales presentation you were outlining, or the article you were writing—without ever moving from your computer. Certain games, like Tetris or Pipe Dream or Klondike, are addictive pastimes—games you can play while chatting on the phone or while someone's got you on interminable hold. Jigsaw is definitely this type of game. And like others of its type, its simplicity is deceptive.

Child's Play

The basic play couldn't be simpler. Jigsaw is perhaps a misappellation; each puzzle is composed of uniformly sized rectangular tiles—8, 15, 40, or 60 pieces, depending on the selected level of difficulty. You click on the piece you want to move, highlighting it, and then click on the one occupying the spot where you want to place the first

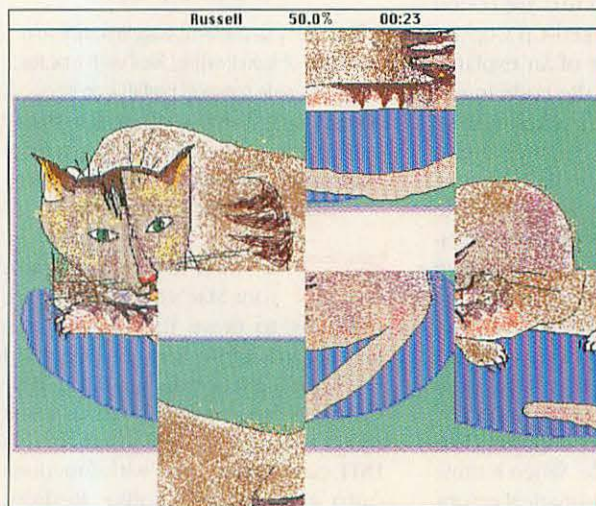
piece; the program instantly switches the positions of the two pieces. A clock keeps track of your playing time. When all the pieces are correctly assembled, the clock stops and your score appears in a pop-up window along with other time records for that challenge level.

In addition to letting you choose the number of pieces, Jigsaw offers several other options for adjusting the degree of difficulty. In standard operation, you can study the puzzle picture as long as you like before clicking the mouse button to scramble the pieces and start the timer. You can also sneak a peek at the picture during play if you need to refresh your memory, although Jigsaw penalizes you each time by adding ten seconds to your score. If you check Hard Way in the Goodies menu, the puzzle appears on screen already scrambled, with the clock running. Hard way also disables the Show Picture option, so you've either got to tough it out or give up. If you quit before finishing, Jigsaw lets you save the puzzle so you can come back to it later. (If you want to look busy for a minute, you can choose Hide window, and the timer waits until you decide it's safe to switch back to Show window.)

Give Me a Hint

The program also comments on your progress as you play. If you make a good move, Jigsaw signals with whatever sound you have set in the Control Panel; otherwise it remains silently noncommittal. This can be a little confusing, since an unrewarded move is

(continues)



P Is for Puzzle

This portrait of a favorite family friend makes an entertaining puzzle for children when divided into 8 easy pieces. But grown-ups should not be fooled—set for 60 pieces and no audio clues, this puzzle could take you the better part of an hour to solve.

Put More Into These Computers Than Apple.[®]



195 Megabytes.



They're today's most powerful personal computers. And to handle really demanding applications, you need to put more into them than 40 or 80 megabytes. Applications like databases. Multimedia. Graphics. Publishing. CAD/CAM/CAE. That's where the MacinStor[™] 195i comes in.

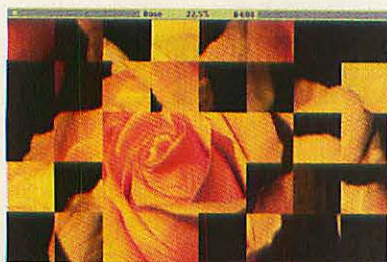
The 195i has been *performance matched* to deliver *total Macintosh[®]* power to every application. With 195 megabytes of capacity. With top performance specs—such as 15ms average seek time and 13 Mbits/sec average data transfer rate. With a

clean, 3.5" drive installation that eliminates power supply and cooling concerns. With comprehensive software utilities that let you easily manage and secure your data. And with 50,000 hours MTBF for long haul reliability.

As with every MacinStor product—internal or external, hard disk or optical, 40 megabytes to a gigabyte—the 195i is a high performance solution no competitor can match. So call up all of the Macintosh power at your fingertips. Call up (408) 879-0300 for MacinStor reseller locations. Or write Storage Dimensions, 2145 Hamilton Avenue, San Jose, CA 95125.



STORAGE DIMENSIONS



A Rose by Any Other Name

Selecting Hard way (no hints and no peeking) from the Goodies menu and 40 pieces under Level should provide more than enough challenge for most puzzle enthusiasts.

not necessarily a mistake. You can turn the sound off if you prefer to do without Jigsaw's kibitzing. There's also a small window at the top of the screen that keeps constant track of the percentage of the puzzle you've completed correctly, sort of the way children say "warmer . . . warmer."

Jigsaw comes with eight gray-scale images and three color images plus the ability to import your own. Some of the puzzles are clearly meant for children—an illustrated ABC and three *Wizard of Oz* characters, for example. The rest are a grab bag—an American flag, a butterfly, a landscape, and so on—suitable for any age player, but not especially engaging. The color images are more appealing, but without a color monitor the difference is academic. Color also makes the puzzles easier to complete. Just try out the impressionistic bathing scene (which, curiously, comes in gray scale only). Even with audio hints and only 8 pieces it's tough; choose 40 or 60 pieces and—well, you've got to have more patience than I do. The colorful rose and freckle-faced red-haired child are more rewarding (see "A Rose by Any Other Name").

Jigsaw has a couple of annoying quirks. For one, my copy of the program crashed a few times when closing a completed puzzle and moving quickly to open a new one. A more perplexing problem is that with imported images, the percent-completed display sometimes seems not to acknowledge a finished picture, which of course means the clock stays on, running up the score. The problem turns out to be that the white space surrounding the picture is also scrambled, although invisibly. That's

not such a big deal if you're working with eight pieces; with more it's an existential nightmare. Pending a solution from Britannica, the easiest way around this problem is to surround your picture with patterned borders that fill the frame. Finally, a minor point: if a puzzle is already on screen, even if you have not yet begun to play, you can't switch to another level of difficulty. It would be nice if you could change the number of pieces without having to exit a puzzle and reopen it.

Do It Yourself

When you tire of the supplied images, you can easily import MacPaint, PICT, and PICT2 format pictures to make your own puzzles, simply by copying them to the Clipboard and opening them as New files. This adds value to the \$39.95 game, because the program itself, even with its adjustable difficulty level, can get stale. If you've got a library of pictures you like or the artistic talent to produce your own, Jigsaw can be an economical and creative tool that offers a pleasant diversion (see "P Is for Puzzle").—**Marjorie Baer**

See Where to Buy or circle 782 on reader service card.

Musical Notation Software

ENCORE 1.2.1

Pros: Transcribes real-time MIDI input; speedy operation on low-end Macs; flexible and simple page-layout controls; sequencer-like MIDI functions.

Cons: Output is relatively primitive; expensive. **Company:** Passport Designs.

Requires: Mac Plus; System 6.0.2; MIDI instruments and interface; Adobe Sonata Font for PostScript printing. Hard disk recommended.

List price: Version 1.2.9 \$595.



Passport Designs' new Encore notation package enters a market already crowded with competition. Positioned as a composer's tool (and as the ultimate accessory for a sequencing package), Encore notates musical input from MIDI instruments and from other programs. The procedure for laying out a score is easy and flexible, and the MIDI side of the program is the best of any notation package I've seen. On the downside, how-

ever, Encore comes with a hefty price tag and a couple of persistent bugs.

Encore's strength is that its overall design and operation are very similar to Pro 4's, Passport's tried-and-true sequencing program. Both packages have similar windows for setting up tracks, and many of the MIDI functions and editing commands are nearly identical. Both programs use a simple set of three cursors (the arrow, pencil, and eraser) to accomplish selecting, entering, and deleting data with the mouse, but Encore displays the musical data in note form, while Pro 4 uses a piano-roll graphic display.

By borrowing so heavily from the strengths of Pro 4, Passport has endowed Encore with a clean, easy-to-understand design, as well as the most functional sequencer ever to appear in a notation program. While it's never going to replace a conventional sequencer, Encore allows you to tweak a score's underlying note data with sequencer-like editing commands. Its capabilities lie somewhere between professional sequencers and other notation programs that support MIDI.

Simple Import

Notes can be imported from Pro 4 or standard MIDI files, can be recorded in real time via MIDI, or can be input by using the Mac keyboard to select note durations and using the mouse to specify placement. Encore lets you create, import, and edit a tempo map, so that you can record a performance over a changing set of tempos; but unlike some of the competition Encore doesn't let you tap a foot switch to control tempo as you're recording. However, entry is usually speedy, since the program doesn't check durations or beam groups of notes as they're input; you must select a region with the arrow cursor and perform the Guess Durations and Beam on Beat commands to see something that resembles correct notation.

Despite Encore's functional track sheet and input filters, real-time recordings are often transcribed raggedly, and the program's simple quantization controls don't completely cure the problem. The best method of real-time input seems to be to use a sequencing program to record and edit the data (*continues*)

If time is money, why is there no accounting for it?

See us at MacWorld
April 10-13, booth #1918.

It is the supreme irony of modern business. That until now, it has been impractical—and often unprofitable—for a business to treat its people's time with the same respect automatically accorded its money.

What's more, it's a costly shame.

Because for most businesses, time is by far their most valuable resource.

Now you can track time for all it's worth.

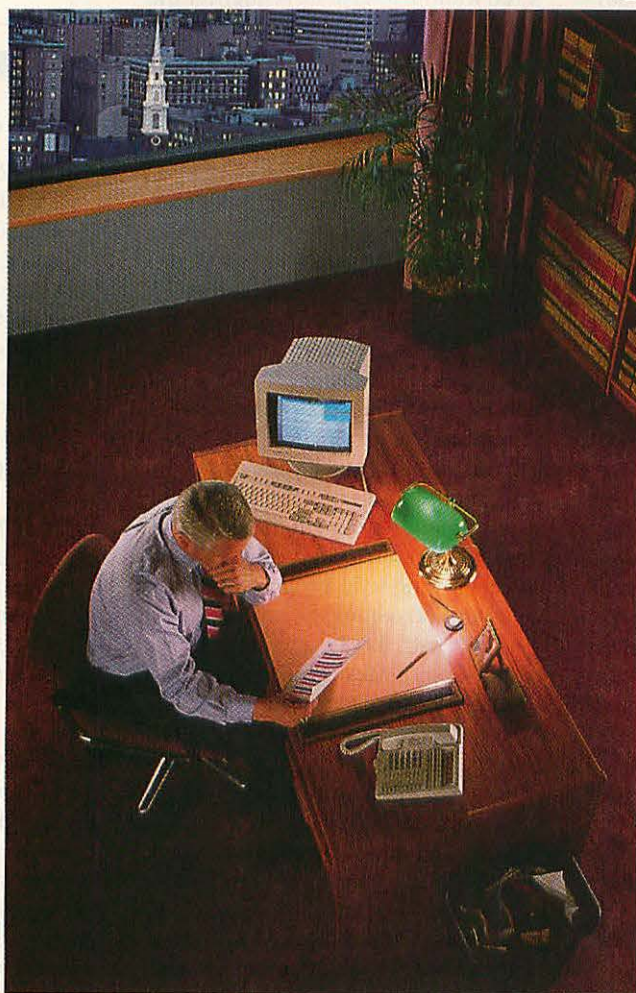
For today's business, the answer is Timeslips® III for the Mac. A complete, sensible, and surprisingly powerful software program that helps accurately

track, analyze, and charge-out both time and expenses. And do so with unprecedented facility and speed.

TIMESLIPS
CORPORATION

© 1990 TIMESLIPS Corporation, 239 Western Avenue, Essex, MA 01929.
Timeslips III is a registered trademark of TIMESLIPS Corporation.

SYSTEM REQUIREMENTS: System Tools 6.0.2. Supports MultiFinder. Operates on a Mac Plus or higher with 1 Mbyte. Hard disk is recommended.



New!
Version 2.0
For Single-User.
Network Edition
Now Available.

Thanks to Timeslips, many people report up to a 25% increase in accountable time. Which means an equal improvement in productivity and income.

Best of all is that Timeslips III for the Mac won MACUSER Editor's Choice Award for Best New Professional Financial Package of 1989.



Get time on your side today.

Timeslips III for the Mac is just \$299.95 at your

software dealer or from TIMESLIPS Corporation. And ask about our network version. We also have a free HyperCard™ demonstration disk that shows you how effective Timeslips III can be for your bottom line.

Timeslips® III

For the Mac

It turns time into money.™

But don't wait. Call today. Because Timeslips III on your computer is as good as money in the bank.

Call 1-800-338-5314
(508-768-6100 in MA) or FAX 508-768-7660.
In Canada call 1-800-359-3343.

before importing it into Encore. I got good results by quantizing note attacks and releases and otherwise cleaning up my performances before letting Encore chew on them; with a little outside help, Encore's guessing routines fare a lot better than they do on music played directly into Encore.

You enter symbols, lyrics, and ornaments by choosing them from palettes and clicking on the desired location, although the default placement for some symbols is not very useful. Many notation programs operate like drawing programs; Encore does not. It provides no way to magnify the view, click on an object to make its handles appear, or move and resize objects. A program in this price range should at least have a Zoom command.

Encore's simple layout commands let you quickly set up systems of up to 64 staves, with fully controllable bracketing and bar lines. Menu commands let you set the number of measures and systems displayed on any page, and page icons at the top of the screen allow you to move quickly to any page. Any range of notes can have one of four alternate note heads. You can display and print any staff at one of four sizes, or you can hide a staff on specified pages. Simple and flexible measure numbering and fields for title, header, footer, and copyright notice on each page round out the program's basic yet sufficient set of layout tools.

A Problem of Positioning

Some of Encore's best-executed features are the ones that few notation programs have, like a command for creating crescendos that play back by ramping up note velocities across a

region, or a command that sets note durations to play back at a percentage of their on-screen value. With a little manipulation, you can create a fairly decent sequence using Encore, so that even without a separate sequencer the program provides fairly listenable playback for proofing purposes. But given the problems with real-time transcriptions, I think it unlikely that Encore will be used as a stand-alone solution to a composer's needs.

Anybody who needs Encore's transcription functions as well as its ability to record and play back (but not edit) MIDI data would be much better off using a simple \$100 sequencer that can export MIDI files (such as Passport Designs' Master Tracks Jr. or Opcode Systems' EZ Vision) as an input module for Encore. This brings up the big question: if you're going to use another program for input, why use a notation program that has MIDI input functions? Why not use a simpler, drawing-style program for transcribing and editing the scores?

I've had the best results so far using Coda's MusicProse (which has limited MIDI capabilities, but can follow live tempos via a foot switch) to edit and print files created in a sequencing program (see *Reviews*, *Macworld*, April 1990).

Encore's main problem is market positioning. It handles 64 staves and it transcribes real-time performances, so it's positioned as a high-end product. Given Encore's simple layout and lack of drawing-style tools, it's probably best suited to MIDI musicians who need to print horn charts and lead sheets, of reasonable—if not of publishable quality—with a minimum of hassle. In this

situation, Encore performs excellently—for a program at, say, \$295. At \$595 it doesn't look any better than the competition.—Charles Clouser

See Where to Buy or circle 739 on reader service card.

★ Color Paint Program

EASY COLOR PAINT 1.1

Pros: Full 256-color support; standard MacPaint-like paint tools with enhanced functionality; variable document size; good speed; extremely low price; runs in black and white on Mac Plus; compatible with 32-bit QuickDraw. **Cons:** Relatively few special effects; no color-separating capability. **Company:** Creative Software. **Requires:** Mac Plus. Mac II and System 6.0.2 or later for color operation. **List price:** \$79.



Mac II owners may have faster computers with dazzling color displays, but they lack something every buyer of a Mac 128K took for granted—basic painting software.

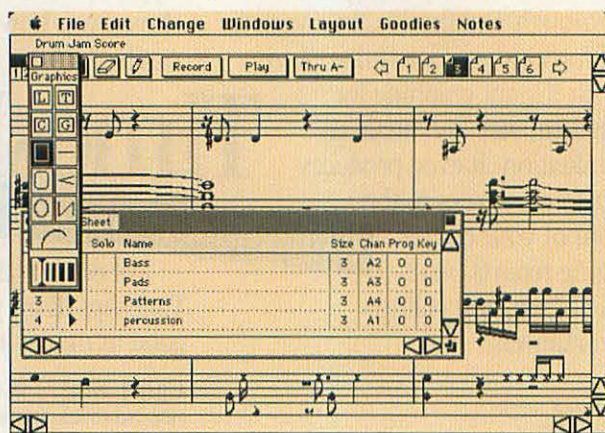
Enter Easy Color Paint, the MacPaint for the color age. Concentrating on simplicity, economy, and fun, Easy Color Paint extends the painting fundamentals originated by Apple's first graphics program to the realm of color computing. But Easy Color Paint doesn't stop there. Though it avoids bells-and-whistles excess, Easy Color Paint improves on MacPaint with numerous additions and refinements, even a few special effects. The result is a satisfyingly strong yet incredibly inexpensive color paint program that casual computer artists—and their kids—will enjoy for hours on end.

Easy Color Paint takes full advantage of the standard Mac II's 8-bit color mode, meaning that you have access to 256 separate colors in each piece of art (if you want to save memory or if you have a less-capable computer, you can choose black-and-white, 4-color, or 16-color modes instead). Yet aside from a few variations in screen layout, the Easy Color Paint working environment is faithful to the archetype established long ago by MacPaint (see "Artist's Tools"). The painting tools now occupy a rectangular window instead of a vertical palette, but you'll

(continues)

Beamed on Beat

This file was imported from a sequencer with note attacks and durations already quantized to 16th notes. Encore then guessed at the note durations and beamed them on the beat. The Track Sheet window, under the tool palette, shows the MIDI parameters for each staff.



**NOW THAT THERE'S A TOTALLY NEW DESKTOP PUBLISHING PROGRAM
WITH AN INTUITIVE USER INTERFACE, THAT ALLOWS FOR THE
PRODUCTION OF DOCUMENTS UP TO 999 PAGES IN
LENGTH, WITH TEXT EDITING CAPABILITIES
THAT MAY ACTUALLY RIVAL YOUR
WORD PROCESSOR, AS WELL AS
TYPOGRAPHIC AND LAYOUT
CONTROL TO SATISFY EVEN
THE MOST DEMANDING
DESIGNER, WHERE
DOES THAT PUT
PAGEMAKER?**

Now there's a Macintosh® program that so greatly expands your publishing horizons, it can't be called just an upgrade for Aldus PageMaker®. It's an upgrade for all of desktop publishing. Because now you have total control—start to finish—over the entire process: writing, editing, design, and production. For any type of document, any length.

Write and edit with an integrated Story Editor™ that includes much of the performance of a stand-alone word processor. This alternate text-only view lets you spell-check, search and replace, change styles—and the layout view is automatically updated.

Create a look with type by rotating text in 90° increments, condensing or expanding type from 5% to 250%, force justifying lines to any specified width, or applying point-size-dependent track kerning across any range of text.

Keep up to date with the new Links management facility. Now you can automatically update a publication with the most recent versions of text and graphic files.

Build files up to 999 pages, and beyond. For long publications, combine files using PageMaker 4.0's Book command to create a common table of contents and index, and to chain-print the files.



Now it's easy to stay on top of all the different steps in desktop publishing. Because with Aldus PageMaker 4.0 you have total

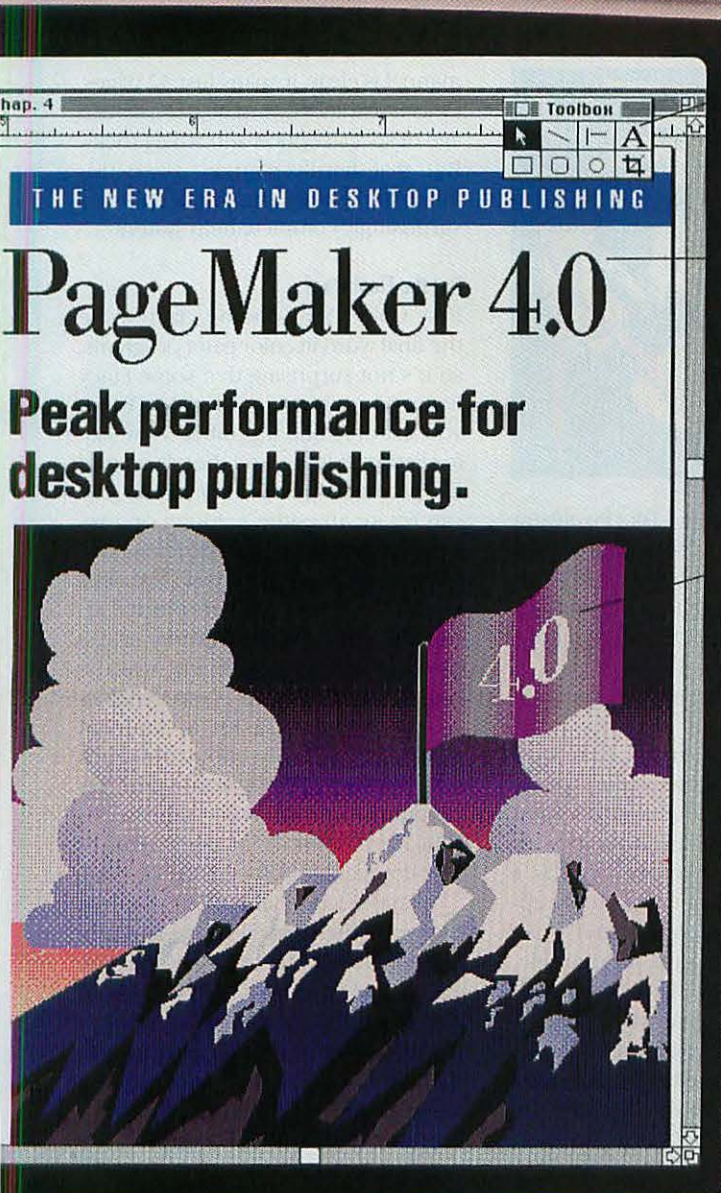


With PageMaker 4.0, you can reach a new high in creative control.

creative control over the entire document creation process; from writing and editing to design and production... all in one comprehensive program.

ALL BY INTRODUCING THE

*Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. Aldus, the Aldus logo, and PageMaker are registered trademarks and Aldus PrePrint and St



The PageMaker toolbox and pasteboard, along with 30 pre-designed layout templates, are some of the reasons why learning and using PageMaker is still so quick and easy.

To be precise, PageMaker 4.0's new typographic controls let you kern over any range of text, or for individual pairs to 0.01 of an em. Assign type sizes or leading from 4 to 650 points, in increments of 0.1 of a point.

Add the impact of color with imported TIFF images and EPS illustrations. Choose from PANTONE®, RGB, HLS and CMYK color models. Then create color separations using an OPI-compatible separator such as Aldus PrePrint™ (purchased separately).

For a brochure or the location of your nearest PageMaker dealer, call **800-333-2538**, Department 2L. Because the best thing about the new PageMaker is not what it can do now; it's what you can do now.



ALDUS®

The Creative Edge
in Business.

ITSELF. NEW PAGEMAKER.

itor are trademarks of Aldus Corp. Macintosh is a registered trademark of Apple Computer Inc. PANTONE® is a registered trademark of Pantone, Inc. ©1990 Aldus Corporation. All rights reserved.

Artist's Tools

Easy Color Paint extends the painting fundamentals originated by Apple's first graphics program to the realm of color computing. It also runs in black and white on a Mac Plus.



immediately recognize most of the icons. Another window contains a familiar smorgasbord of bitmap patterns. There is one obvious addition to the screen, however: the large palette from which you select foreground and background colors for your artwork.

Basic Color Painting

At its most basic, color painting with Easy Color Paint is as straightforward as painting in black and white with MacPaint, and it's even more fun. Pick a color and pattern, choose a tool, and start painting—if you like MacPaint, you'll be spellbound when you see what intense stabs of red or peaceful pastel washes add to your artwork. The program is fast and responsive, even with all those colors to keep track of, and it functions flawlessly. All of the traditional painting tools (paintbrush, spray can, paint bucket, pencil, and so on) work just as you'd expect.

Easy Color Paint offers a healthy set of enhancements, some of them having to do with color per se, some representing improvements on the fundamental painting tools. In the color department, your first advanced choice is which of six 256-color palettes you want to paint with (my favorite is Winter Forest, a selection of icy grays, blues, and pinks). You can also decide how the colors on the electronic brush get applied to the screen. In the standard method, the new colors obliterate whatever was there before. Five other options combine what's on the brush with the colors it passes over in various ways for a broad range of useful effects. There's even something called wacky color rotation, which automatically switches to new foreground and background colors

several times a second. Like PixelPaint and Studio/8, Easy Color Paint comes with an eyedropper tool. This tool lets you switch to a color that's already on the screen; you don't have to find it on the palette.

MacPaint Extended

Color aside, Easy Color Paint's biggest accomplishment is the way it extends the capabilities of the basic MacPaint tools without sacrificing simplicity. As in PixelPaint, nearly every tool has a menu of its own, but these only appear when that particular tool is active. In the Brush menu, for example, you can choose the size of the brush over a wider range than MacPaint permits and select from a long list of brush shapes. Likewise, the Eraser menu lets you choose the size of the eraser—a welcome improvement over MacPaint—and also lets you determine whether the erased areas are filled with white or the background color. The Marquee (sic) menu allows you to select a rectangular, circular, or oval shape for the marquee, it also lets you specify how a marquee is defined with the mouse (by dragging from one corner to the opposite corner, by dragging out from the center, and so on).

Since Easy Color Paint stores its files in PICT format, you'll have no trouble exchanging files with most other Mac graphics applications. The program can also open MacPaint files and accept pasted images from the Clipboard. Ordinarily, Easy Color Paint paintings are sized to match either the standard MacPaint document or a full Mac II screen, but the program lets you define a custom size and will also adjust automatically to match any PICT document you read in. Although the

manual is clear, it spans just 32 pages, lacks illustrations, and neglects coverage of special option and ⌘-key tricks. But that hardly matters, since this modestly named program sports a surprisingly complete help system.

Not the Final Word

Easy Color Paint doesn't claim to be the final word in color paint programs, so it's not surprising that some fancy features are missing. As in MacPaint, you get only one magnified view size for FatBits editing, and there's no grid for precision positioning. While you can rotate an entire painting or a selected region in 90-degree increments, free rotation isn't permitted. Nor does the program let you alter selected areas with perspective, skewing, or distortion effects. I particularly miss the brush mirrors feature—color kaleidoscopes would be a lot of fun. But probably the most serious drawback for professional illustrators is that this program can't do color separations (but Easy Color Paint does print to Mac-compatible color printers).

Easy Color Paint won't replace high-end, high-priced color paint programs, and serious artists should look elsewhere. But if you'd be happy with a color paint program that has the low price, solid performance, and good-natured appeal of MacPaint, buy Easy Color Paint—it's even better, and it's less expensive.—**Steve Cummings**

See Where to Buy or circle 737 on reader service card.

★
Infrared Connectors for LocalTalk**PHOTOLINK**

Pros: Easy to reconfigure networks; easy to set up; can be used in almost any environment. **Cons:** None.

Company: Photonics Corporation.

Requires: LocalTalk or equivalent connectors from Mac to Photolink. **List price:** \$1195.



What looks a bit like ET, sits atop your cubicle, and keeps you connected to the file server? It's Photolink. And it could certainly change the way office networks are connected. Rather than depend completely on Apple's LocalTalk cables (continues)

Your FREE ticket to Wall Street.

- Yes!** Please send me more information. I want to take advantage of the FREE sign-up for the GENie™ Service with Schwab AND the special offer for the new Hayes PERSONAL MODEM 2400plus and Smartcom™ software for the Mac® at the low price of \$159!* (Save \$69.95!)
- Yes!** Please send me more information on signing up for Charles Schwab Brokerage Services and the GENie Service FREE!* (Save \$29.95!)

PLEASE PRINT CLEARLY.

Name: _____

Address: _____

City: _____

State: _____

Zip: _____

Phone: (Day) () _____

(Evening) () _____

For faster service, call toll free:

1-800-992-3333

Member: SIPC. © 1990 Charles Schwab & Co., Inc. All rights reserved.

*Special offer expires December 31, 1990.

GENie is a trademark of the General Electric Company. Smartcom is a trademark of Hayes Microcomputer Products, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

CHARLES
SCHWAB
BROKERAGE
SERVICES ON
GENie

**Here's how to sign up online
for the GENie Service FREE*
with your modem:**

1. Set your modem for half-duplex (local echo) at 300, 1200 or 2400 bps.
2. With your modem dial toll free 1-800-638-8369. Upon connection, enter HHH.
3. At the U#= prompt, enter XTX99584, MACWORLD then press [RETURN].

 **Hayes®**

OV2BR

ATTN: Dept. S



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS

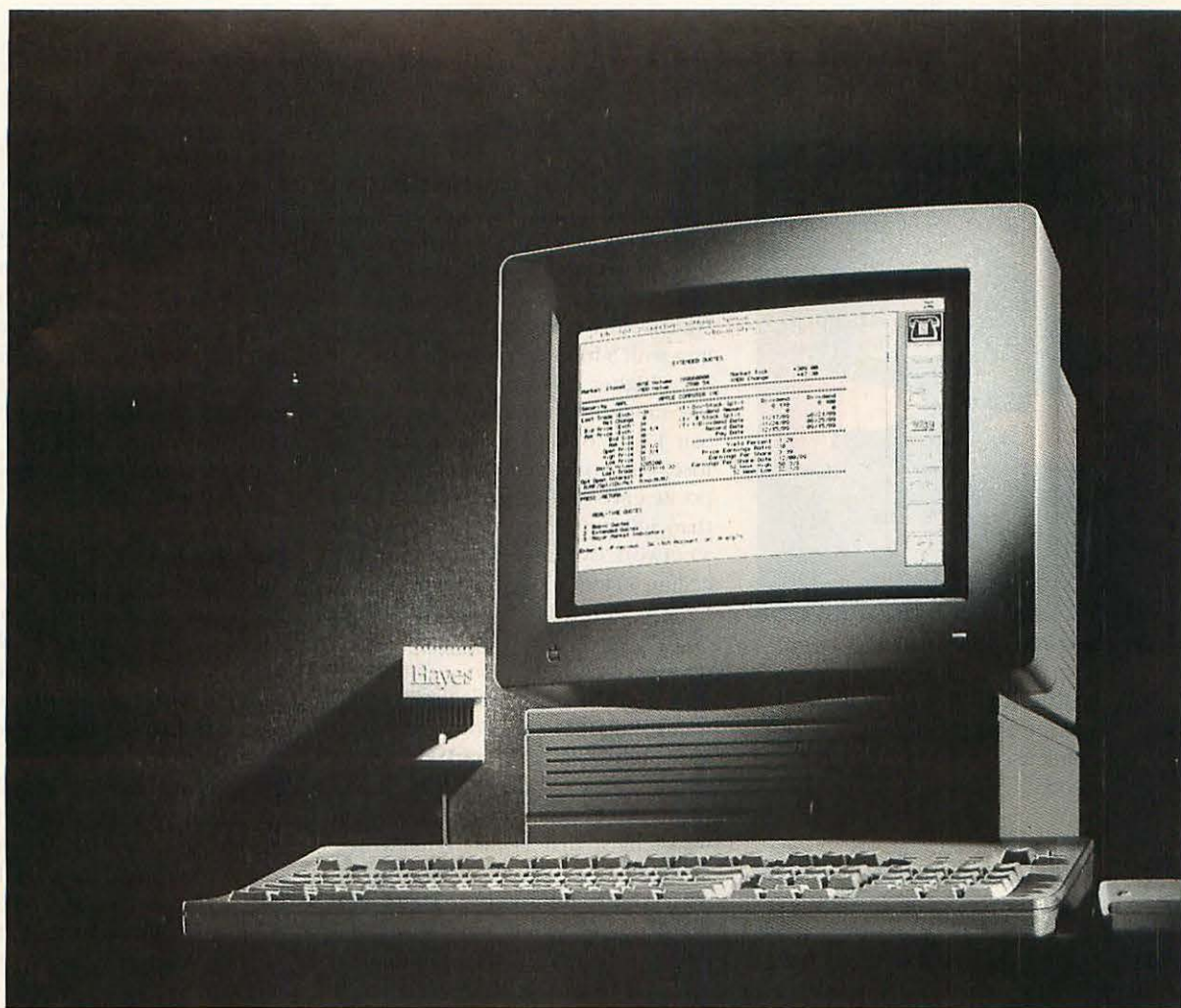
PERMIT NO. 18125

SAN FRANCISCO, CA

POSTAGE WILL BE PAID BY ADDRESSEE

CHARLES SCHWAB & CO., INC.
101 MONTGOMERY ST.
SAN FRANCISCO CA 94104





Open a window and take a look at Wall Street.

Now you can look to your Mac® to see what's happening out on the Street.

With Charles Schwab's Brokerage Services on GENie,SM you can get real-time quotes and trade stocks, options, bonds and mutual funds, right from your Macintosh®.

Save 10% on Schwab's commissions!*

With every trade executed online with Schwab, you'll save 10% *more* on Schwab's already discounted commissions.

Plus, you'll have instant online access to up-to-the-minute news, research, and detailed personal portfolio and Schwab account information.

At Schwab's unique Investors' RoundTable, you can talk shop online with investors across the country and abroad. Even join in question and answer sessions with leading professionals.

Let Hayes® put you online!

The new Hayes communications package for the Macintosh, featuring the PERSONAL MODEM 2400plus and SmartcomTM software for the Mac, makes reaching Schwab through GENie easier than ever. As the

industry leader, Hayes gives you unsurpassed ease of setup and operation. You'll save both time and money through high speed communications. This package (modem, SmartcomTM software, Schwab and GENie sign-up) is only \$159! ** Save \$69.95!

Act now and sign up for the GENie Service and Schwab FREE! **

Call today or use the instructions on the attached card and sign up for GENie information services FREE! (Save \$29.95!) In addition to Schwab's Brokerage Services, GENie provides instant access to market news from Dow Jones, stock research and analysis, and much more.

So sign on today and throw open a whole new world of investment opportunities. We think you'll like what you see.

For more information, complete and mail the attached card, or call toll free:

1-800-992-3333

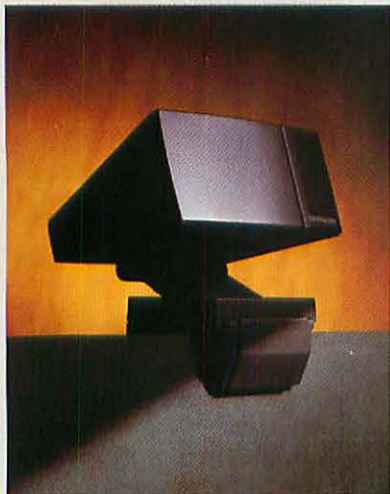
Charles Schwab

We give you more ways to succeed.

Member, SIPC. © 1990 Charles Schwab & Co., Inc. All rights reserved. GENie is a trademark of the General Electric Company. Smartcom is a trademark of Hayes Microcomputer Products, Inc. Macintosh is a registered trademark of Apple Computer, Inc.
*This discount cannot be used in combination with any other Schwab discount or promotional offer. **Special offer expires December 31, 1990.

Circle 71 on reader service card

MARK JOHANN

**Photolink from Photonics**

or unshielded twisted-pair wires (PhoneNet and its derivatives), the Photolink uses infrared light to create a network.

Point and Connect

The Photolink is an AppleTalk replacement for network cables. There's no software to install; you connect the Mac to the Photolink with the LocalTalk cabling. Attach a minimum of two Photolinks to something sturdy (like a cubicle wall), aim them at a common spot, and a network is born.

That's all there is to setting up the Photolinks; it is difficult to believe, but it really is that simple. Each Photolink comes with its own power supply and four RJ-11 sockets to connect the Macs and peripheral devices to the Photolink network. The Photolink bracket contains much of the electronics and includes a C-clamp for anchoring the Photolink to the top of a cubicle divider. Photonics also provides two pieces of Velcro for attaching the Photolink to a wall.

Once the Photolinks are anchored, you select an area on a wall or ceiling where all the infrared beams can intersect to exchange data. Point one Photolink at the desired spot and turn it on. Turn the next Photolink on, and aim it at roughly the same spot. A green light on the back of the unit blinks slowly and then more rapidly as the signal received from the other Photolink increases in strength. Pick the Photolink orientation that gives the most rapid blinking and you're all set.

Setup Rules

The Photolink is versatile. You can point from 2 to 32 units at the same spot to exchange networked data. All the Photolinks should be located within 35 feet of the target spot in a typical office environment (9-foot ceilings with 5-foot-high partitions). If you have higher ceilings, you can extend the range of the Photolinks. At the San Jose Convention Center in San Jose, California, two Photolinks at opposite ends of the meeting hall (more than 500 feet apart) were able to form a network by targeting an area on the ceiling 50 feet above the floor.

The Photolink's infrared beam doesn't work well with highly reflective surfaces; it requires a diffuse reflection of the signal from another Photolink (surfaces like acoustical ceiling tiles and regular walls work just fine as target areas). On the other hand, because the Photolink uses an infrared wavelength that is just outside the normal range of visible light, you can use ordinary mirrors to reflect a Photolink's beam around corners to connect to other rooms. Transmitting the infrared beam through an interior window (between an office and the hallway) also had no adverse effect on the Photolink's performance.

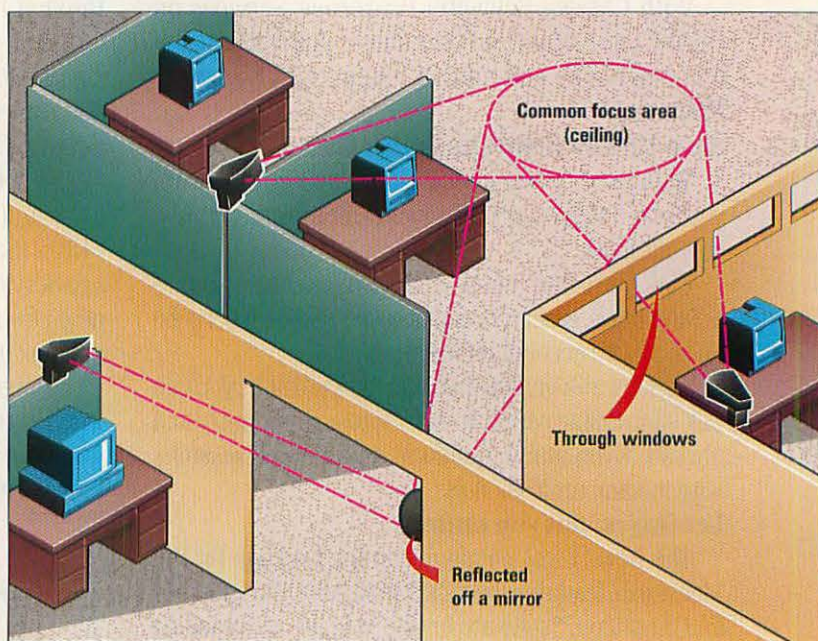
Each Photolink has four network ports. If you're using Apple's LocalTalk cabling, you can connect one de-

vice per port, according to Photonics. The company also suggests daisy-chaining a maximum of two devices per port if you're using PhoneNet wiring. However, I tested the Photolinks with a daisy chain of five devices on one port without problems. In most cases, it's wise to stay away from long daisy chains when designing a network, so Photonics' rules are more an extension of the principles of good network design than a limitation specific to the Photolink.

Ready, Aim, Network

Networks change; people move; new equipment comes in; cubicles are added or removed. In a cabled network these changes might require rewiring. This can take days to accomplish. Photolinks offer a much easier, simpler form of networking while playing musical cubicles. Regular wiring schemes such as LocalTalk and PhoneNet are good for established networks that don't change much, but Photolink is a good choice for large offices where cubicles or offices change location and require frequent rewiring. At a price of \$150 per device (two devices per port for a total of eight devices per Photolink), the Photolink is also a cost-effective solution to rewiring a network; it'll probably pay for itself after the first reorganization. —Dave Kosiur

See Where to Buy or circle 830 on reader service card.

**One possible Photolink configuration**

EXPLORER™

Broadcast-quality video is finally coming to the Macintosh.

Forget everything you've heard about Macintosh® video. With Intelligent Resources' Video Explorer, video will never be the same!



Takes up just one NuBus™ slot in your Macintosh.

We've invented a totally new kind of video card for the Macintosh, with incredible

real-time video processing capabilities. The Video Explorer is a multi-synchronous card that supports all



Luminance and chrominance keys



Multiple inputs

major broadcast video and computer graphic timing standards. On it you'll find a state-of-the-art custom

chip set, one of the largest and most powerful ever produced for personal computers.



Since the Video Explorer is a programmable 32-bit digital video engine, there's almost no end to the broadcast-quality effects you'll be able to achieve. You'll have full control of video processing: frame by frame, line by line,

and pixel by pixel. You'll be able to perform fades, wipes, dissolves, and digital video effects.

You can key on chrominance and luminance signals, combine multiple live video signals, and even overlay anti-aliased titles and graphics on live video.

The Video Explorer can simultaneously manipulate video signals from a variety of

sources, both live and computer generated. By genlocking to a common sync signal, a Video Explorer can accept



Anti-aliased titles and graphics



Real-time effects

video from an external source as well as from internal sources cascaded through our digital video bus. This down-

stream capability allows linking of video bus-compatible cards for even more sophisticated special effects.

Soon, the power of this new video technology will be unleashed. Join us as the serious fun begins!

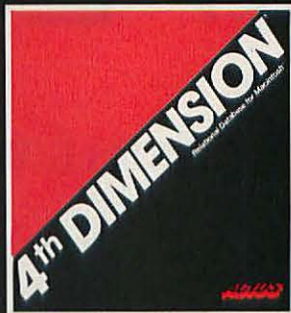
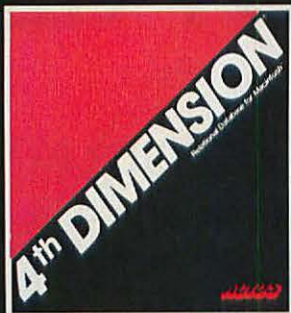
Intelligent Resources, 1626 Colonial Parkway, Inverness, Illinois 60067. Phone (708) 705-9388 or Fax (708) 705-9410.



INTELLIGENT RESOURCES

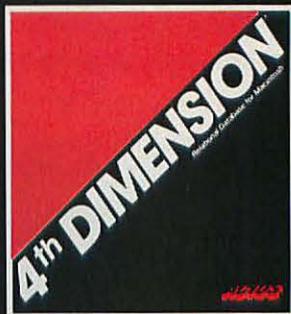
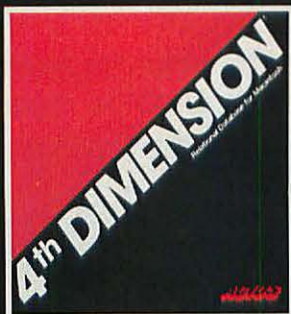
Which Database?

4th DIMENSION now offers the easiest-to-implement relational capabilities; its overall functionality and programming capabilities may make it the first real Macintosh database standard.
INFOWORLD, September 1989



4th DIMENSION outshines all the other databases with its number of features and rich database development environment (...). Of the current programs, 4th DIMENSION is the most complete and powerful.
BYTE, January 1990

Given that 4D was the first program to allow database designers to build a Macintosh interface, Acius has the advantage of experience over its competition.
MacWEEK, June 1989



ACIUS has created a rich environment for database users at all levels.
MACWORLD, January 1990

4th DIMENSION 2.0 is a rare treat (...). You really can create powerful multifile database systems without getting involved in coding at all.
MACUSER, February 1990



Only the Best!

To order a \$20 demonstration kit, call (408) 253-DEMO

ACIUS

10351 Bubba Road, Cupertino, CA 95014 (408) 252-4444

Circle 72 on reader service card

★
Professional MIDI Interfaces

MIDI TIME PIECE

Pros: Eight independent MIDI inputs and outputs provide up to 128 MIDI channels; can attach to three additional MIDI Time Pieces to accommodate extremely large MIDI networks; desk accessory provides versatile routing and filtering options for MIDI data; synchronizes reliably; excellent manual.

Cons: Uses external power adapter.

Company: Mark of the Unicorn.

Requires: Mac Plus. **List price:** \$495.

STUDIO 3

Pros: Accepts optional foot switches for real-time control of certain MIDI data; provides rear-panel modem and printer ports; synchronizes reliably.

Cons: Only two MIDI inputs; minimal MIDI routing options; weak documentation.

Company: Opcode Systems.

Requires: Mac Plus. **List price:** \$379.



The musical instrument digital interface (MIDI) lets you connect one or more electronic instruments to a computer. Once that's done you can use sequencing software to create multipart arrangements and use editing software to alter and manage the instruments' sounds (see "Getting Started with MIDI," *Macworld*, August 1990).

But before you can create a silicon symphony on a Mac, you need the interface itself—a box that connects MIDI instruments to the Mac's modem or printer port. For simple MIDI setups, consider one of the low-cost (\$100 to \$200) MIDI interfaces available from Apple, Opcode Systems, Passport Designs, or J. L. Cooper Electronics. If you want to connect more than three instruments to the Mac—or if you need to synchronize sequencer software to external devices—you'll want a more sophisticated MIDI interface, such as Mark of the Unicorn's MIDI Time Piece (MTP) or Opcode Systems' Studio 3.

These high-end devices provide several MIDI In and one MIDI Out connector. This lets you create large MIDI networks without daisy-chaining (connecting one instrument's output

to another instrument's input), which can lead to delays in MIDI data transmission when numerous MIDI devices are interconnected.

Both the MTP and the Studio 3 interfaces also let you synchronize sequencer software with an audio or video tape recorder. The interface can record a synchronizing, or sync, tone, which carries timing information, on one track of an audio or video recording (a process often called striping). When you play back the recorded sync tone, the interface interprets it and generates MIDI Time Code signals that a sequencer program locks on to, thereby ensuring that the sequencer and the audio recorder play back at the same pace.

Ins and Outs

Both the MTP and the Studio 3 work well and provide similar features, but the MIDI Time Piece takes first place. For starters, it offers 8 MIDI In and 8 MIDI Out connectors; the Studio 3 offers just 2 MIDI Ins and 6 MIDI Outs. The MTP gives you a total of 128 independent MIDI channels—in theory, at least. The MTP's cabling scheme is currently supported by only one sequencer—version 3.4 of Mark of the Unicorn's Performer. If you don't use Performer, the MTP provides 32 independent MIDI channels. Mark of the Unicorn reports that other companies plan to update their software to take advantage of this capability.

You can connect up to four MTPs to provide a whopping 512 MIDI channels. What's more, the cables that interconnect MTPs can be up to 1000 feet long, versus the roughly 50-foot

maximum length for MIDI cabling. That extra 950 feet could be significant if you're wiring an auditorium or large recording studio for MIDI.

Both the MTP and the Studio 3 come in 19-inch cases designed to fit standard equipment racks. To save you from snaking your arm around the back of a rack, the MTP provides one MIDI In and one MIDI Out on the front panel—a nice touch.

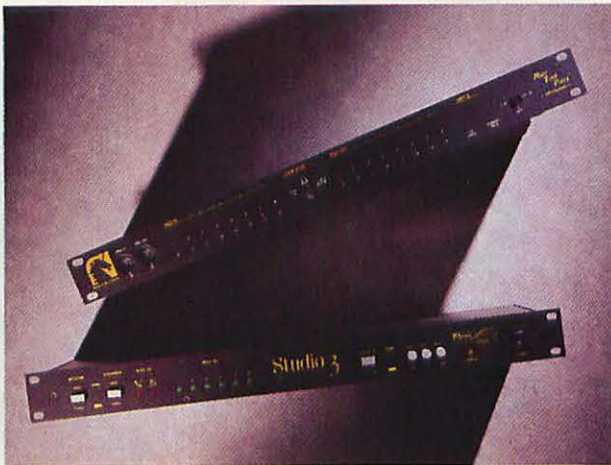
Like most MIDI interfaces, both the MTP and the Studio 3 run at a 1MHz clock rate. The MTP, however, also has a fast mode that lets it run faster when connected to a Mac with a 68020 or 68030 processor. The fast mode boosts performance and reduces the chance of timing delays when the Mac is transmitting large amounts of MIDI data.

Inexpensive MIDI interfaces monopolize a Mac's modem or printer port. To use a modem or printer, you must disconnect the MIDI interface and connect the modem or printer. Not so with the MTP and the Studio 3. The MTP provides a second modem port, while the Studio 3 provides a modem and a printer port. Both interfaces let you choose between MIDI and standard serial-port operation by flicking a front-panel switch.

Sync or Swim

In the sync department, the MTP and Studio 3 provide similar features—both can interpret and generate the industry-standard SMPTE (Society for Motion Picture and Television Engineers) time code, in all four of its formats. Both can also convert incoming

(continues)

**MIDI Interfaces**

The MIDI Time Piece (top) and the Studio 3 both provide sophisticated communication between your Macintosh and three or more MIDI instruments.

MARK JOHANN



Of course the presentation went well. I had professional help.

These days, it's not enough to have great ideas. You have to get those ideas across. Cut through the clutter. And make them stick.

And that's why there's Metro ImageBase®. The only electronic clip art that lets you confidently add quality pictures where words alone won't do. In everything from presentations and reports, to newsletters and correspondence.

First, Metro ImageBase looks better than other clip art. Drawn with more detail, with more style and artistic flair.

You'll also find we have more of the art you need. Better organized, in packages like ReportMaker, NewsletterMaker, Borders & Boxes, Travel, and more. Each with 100 images,

© 1990 Metro ImageBase, Inc. All art copyright Metro Creative Graphics, Inc. Metro ImageBase is a registered trademark of Metro Creative Graphics, Inc. The Fine Art of Communication is a trademark of Metro ImageBase, Inc.

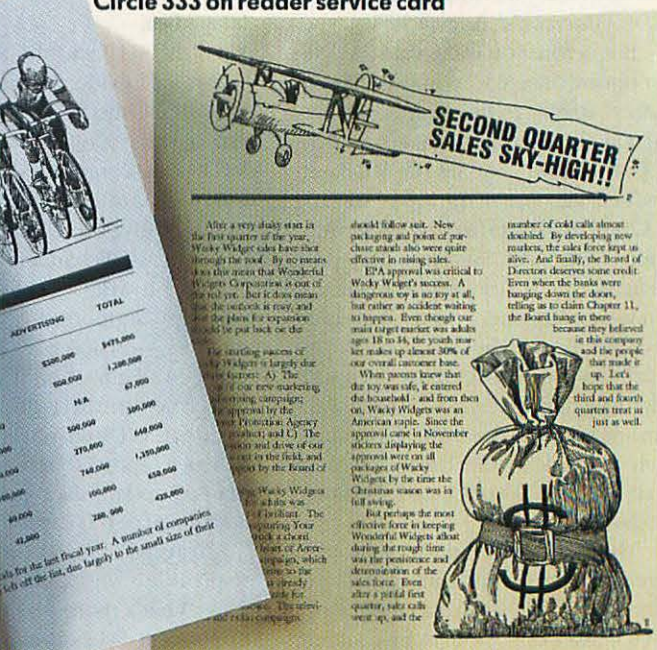
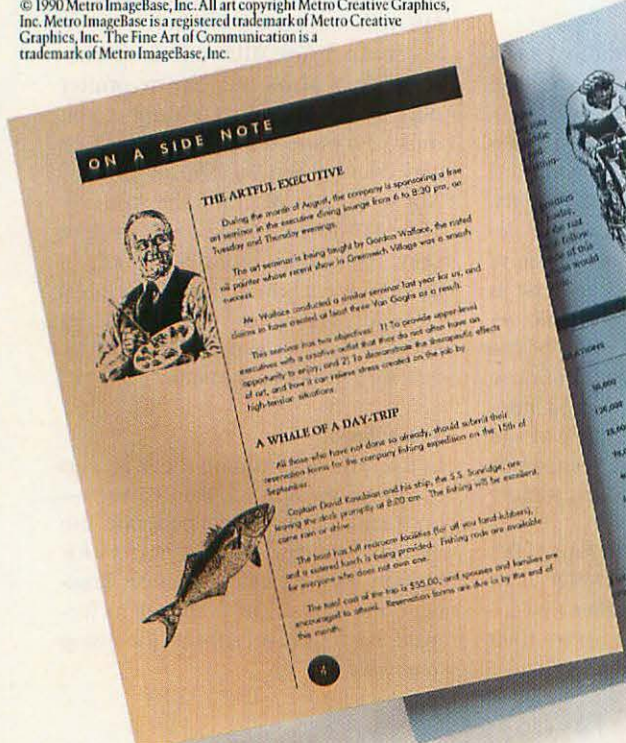
compatible with just about every DTP, presentation graphics, and word processing package that handles graphics in the first place. On both the Mac® and PC.

And with full 300 dpi resolution, Metro ImageBase stands up to more scaling, both up and down, so it fits where you need it, and always looks great.

Ask for Metro ImageBase at your software dealer. And make your next document the very picture of success.

Circle 333 on reader service card

METRO
IMAGEBASE
The Fine Art of Communication™



For more information, or to order, call today: **1-800-525-1552**

Metro ImageBase, Inc., 18623 Ventura Boulevard, Suite 210, Tarzana, CA 91356 ■ Fax: (818) 881-4557, outside U.S. call: (818) 881-1997

SMPTE to MIDI Time Code, and both provide *jam syncing*, in which the interface regenerates incoming SMPTE code in real time to avoid a weak sync signal that could result in the loss of synchronization.

Both interfaces provide a desk accessory that allows you to specify sync settings and begin striping a tape. The MTP comes out ahead here, too. Its desk accessory lets you adjust the output volume of the sync tone; the Studio 3's output volume can't be adjusted.

As sync boxes, both the MTC and Studio 3 performed beautifully, tolerating weak or poorly recorded sync tones and occasional dropouts. Both boxes were even able to interpret sync tones recorded on an aged stereo cassette deck whose heads are out of alignment.

Routing and Muting

Most MIDI interfaces, including the Studio 3, simply act as conduits for MIDI data, shuttling it between the electronic instruments and the Mac. The MTP is more versatile. Its desk accessory lets you change the MIDI channel assignments for each input and output cable, route any input cable to any output cable, and selectively filter certain kinds of incoming or outgoing MIDI data (see "Manipulating MIDI"). These features spare you the

effort of plugging and unplugging MIDI cables and twiddling dials on the MIDI equipment. Best of all, the DA can save a given configuration on disk.

Studio 3's routing options are minimal. You can route each of its MIDI Outs to the Mac's modem or printer port, but you can't rechannel or filter MIDI data. You can save and restore its settings by copying a Studio 3 start-up document to the System Folder, but you can't save several sets of settings and switch between them.

Choosing an Interface

Although the MTP bests the Studio 3 in several areas, the Studio 3 does have some noteworthy pluses. It accepts up to three foot switches that you can use to generate MIDI data or remotely control a sequencer program. Two of the foot-switch jacks work with on/off foot switches, while the third accepts a continuous-control pedal. Using the latter, you can control a MIDI device's volume or any other setting that uses continuous data.

Another plus for the Studio 3 is its internal power supply; the MTP uses an AC-to-9-volt adapter that seems out of place on a piece of professional MIDI equipment. If I were subjecting an MTP to the rigors of the road, I'd carry along a spare adapter or two.

The sequencer software you use may also influence your choice. The MTP works best with Performer, and the Studio 3's manual contains numerous references to Studio 3 features that will work with future versions of Opcode's Vision. It stands to reason that each company will make its hardware and software work well together, so if you've bought in to one camp already, you may want to stay there. (And incidentally, if you already have a simple MIDI interface and you just need sync features, consider Opcode's \$199 Timecode Machine.)

In the end, however, the MTP's eight MIDI Ins and eight MIDI Outs, its versatile routing, muting, and channeling options, its elegantly designed desk accessory, and its tutorial-laden manual give it the edge. If you can live without the Studio 3's foot-switch options and internal power supply, the MTP is the better buy.—Jim Heid

See Where to Buy or circle 816 (MIDI Time Piece), 849
(Studio 3) on reader service card.

★ Business Accounting Program

ACCOUNTANT, INC. PROFESSIONAL 1.03

Pros: Highly competent; menu-driven; includes both Inventory and Payroll segments; good supporting documentation.

Cons: Does not make optimum use of Mac interface; annual payroll-tax updates must be purchased from publisher.

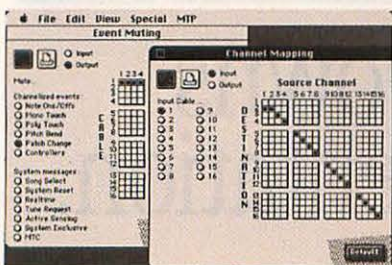
Company: Softsync. **Requires:** Mac Plus; hard disk. **List price:** \$595.



Accountant, Inc. Professional (AIP) is an updated version of Accountant, Inc., which contained General Ledger (G/L), Accounts Receivable (A/R), Accounts Payable (A/P), and Inventory Management modules in a single program. Although the program has been improved in many areas, the major change is that a Payroll module and a Job Costing feature have been added, making the program equivalent to Computer Associates International's Simply Accounting. (Layered's atOnce is in the same price range but does not include an Inventory module. CheckMark Software's MultiLedger, also in the same range, offers Inventory but not Job Costing.) AIP, like Simply Accounting, is a single-user package, although it can be shared on an AppleShare or TOPS network.

AIP works through conventional bookkeeping methods rather than in real time. This means that you must post G/L entries at appropriate intervals; they cannot be entered automatically each time you close an entry screen. In addition, the program has a data-saving facility that maintains data integrity should the system crash before posting. Unlike Simply Accounting's fixed 12 periods, AIP allows you to choose either a 12- or 13-period fiscal year, and the entire year's books remain continuously open so that you can make entries in any period. Unlike atOnce and other programs that allow more than a year's worth of periods to remain open, AIP entries are confined to the current year. And, AIP does not allow you to lock designated periods to prevent entries in the wrong month.

(continues)



Manipulating MIDI

The key to the MIDI-manipulating talents of Mark of the Unicorn's MIDI Time Piece is its desk accessory. Two of its windows appear here. The Event Muting window lets you selectively mute 13 types of incoming and outgoing MIDI data. Here, the window is configured to mute any MIDI patch change messages that would otherwise be sent to output cable 1. The Channel Mapping window lets you route incoming and outgoing MIDI data to a different MIDI channel. Here, all incoming MIDI data received on channel 1 of input cable 1 is being routed to channel 2. You can save all MIDI Time Piece settings on disk.



Take the Oops & Downs out of your next presentation.



Tired of fumbling with slides? Fiddling with transparencies? Losing your audience?

Well, it's time to use an LCD projection panel from In Focus Systems. It lets you project information just as it appears on your computer screen. Even bright, brilliant colors.

So you make stronger presentations. And easily hold any audience.

What's more, the 640x480 display works with IBM® compatibles, and the Macintosh® family, too. For more information or the name of the dealer nearest you, call 1-800-327-7231, today.

Then take the oops and downs out of your next presentation. And put the audience in the palm of your hand.

1-800-327-7231.



See it. Believe it.

IN FOCUS SYSTEMS, INC.

7770 Southwest Mohawk Street, Tualatin, Oregon 97062.
1-800-327-7231. Oregon, 503-692-4968. FAX, 503-692-4476.

IBM and Macintosh are registered trademarks of their respective companies.

Circle 63 on reader service card

Although the terms *debit* and *credit* appear occasionally, the program demands little bookkeeping knowledge outside of the training provided in the documentation and tutorial.

Making AIP Entries

A/R and A/P entries are made from either the Journals or Forms submenus. Any A/R or A/P entry that affects Inventory must be made from one of the electronic forms in the Forms submenu—an Invoice (for A/R sales), a Credit Memo (for returns), or a Purchase Order (for A/P items purchased for Inventory). There is also a fourth form for preparing, printing, and storing job quotations or estimates.

When you access the invoice form, you enter the customer ID, which can be either made up of letters, numbers, or a combination (see "AIP's Electronic Invoice Form"). If you press Tab or Return in the ID field, a list of customers appears; you can click to select one. (You can also call up the Lists submenu, type the first few letters or numbers of the ID, and hit return; the program selects the closest match.) AIP fills in all billing and shipping information, along with any default information such as credit terms.

You can also use a scrolling list to pick inventory items to be shipped and billed. If there's a problem with a selected inventory item—such as insufficient stock to fill an order—AIP alerts you. The program also tracks customer credit limits, warns you of sales over the limit, allows you to override the credit limit or cancel the order.

The program allows either balance-forward or open-account billing and provides separate forms for billing (or crediting) for merchandise or services. The Inventory module allows you to bundle separate merchandise items into a single inventory item that can be billed at a discount. The A/P module works in a similar way to prepare Purchase Order forms for vendors; it adds items to inventory.

You also make A/P, A/R, and General Journal entries—such as preparing a General Journal adjustment or recording a cash sale—from the Journals submenu, but these entries do not affect Inventory activities. You also

AIP's Electronic Invoice Form

Customer invoices for inventory items sold must be written on the electronic Invoice form selected from the Forms menu. The form makes excellent use of pop-up windows for selecting customers and inventory items. Sales not involving inventory items (as well as such things as customer payments and credits) are made directly from the Sales Journal in the Journals menu.

enter customer payments, credits, and refunds, and print customer statements at the end of each period from the Journals submenu.

AIP's A/R module automatically calculates finance charges and early-payment discounts and allows partial payments on account. Simply Accounting's A/R does not. Also, AIP allows direct printing of checks from the G/L, while Simply Accounting doesn't.

Payroll

The new integrated AIP Payroll module is similar to Simply Accounting's, but AIP's allows up to 50 defined deductions instead of only 3, and adds sales-commission tracking. You maintain the Employee list (like the Inventory, Customer, and Vendor lists) from the Edit submenu, where you add, delete, and update records. You can override individual items or deductions. Unlike MultiLedger's Payroll program, AIP posts hours to the employee records rather than in a single screen.

If you keep books for a small business with constantly changing employees and employee hours, you would be better off with MultiLedger (although you would lose job costing). If your work force and its hours are fairly stable, however, the Accountant, Inc. Professional process should present no problems. AIP provides all the necessary payroll reports, such as 940, FUTA, and SUTA, along with standard reports such as check registers, earnings summaries, and pay-period summaries. You can also print employee W-2 forms

at the end of the year.

Following what appears to be the current trend in bookkeeping programs, AIP provides payroll-tax update programs each year for \$95 (a discount certificate is provided for the first update). I hope MultiLedger's Payroll program, which allows the user to update tax tables, will inspire other publishers to do the same or at least give them that option.

Other Features of AIP

Neither Simply Accounting nor AIP allows you to create true custom reports, but AIP does offer far more kinds of reports and limited customization. AIP also provides detailed reports on such things as which customers are ordering what inventory items, what inventory items are low, when did a customer last place an order, and what is his or her available credit. AIP can produce detailed reports on posted data that give you a much better audit trail than Simply Accounting. In addition, AIP lets you export reports to a word processor, spreadsheet, or database.

AIP offers Average or LIFO valuation of Inventory compared to Simply Accounting's Average method only. AIP provides horizontal password protection, which restricts certain users to specific segments of the program.

The Bottom Line

AIP is a full-featured and comprehensive bookkeeping program that does a highly competent job of managing the books for a small business. The documentation is thorough. With AIP, Softsync includes a HyperCard tutorial stack, along with six sets of sample Charts of Accounts representing a variety of retail, service, and manufacturing businesses. The program, unfortunately, lacks the smooth and well-integrated Mac interface of a program like atOnce. The slick atOnce, however, does not offer integrated Inventory control.

In a nutshell, AIP offers you a direct alternative to the comparable but somewhat lower priced Simply Accounting. And Softsync has expanded Accountant, Inc. Professional to provide a much wider range of features and capabilities, thus justifying the price differential. —Alan L. Slay

See Where to Buy or circle 701 on reader service card.

Six Simple Steps To Create Your Own Software

1 Buy Serius Programmer...

- Purchase from your local software dealer, or call toll free at 1-800-876-6847
- Only \$295.00 plus shipping
- Unlimited free technical support

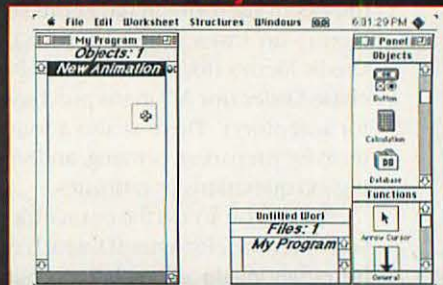
Buy Serius Programmer for \$295.00 or Serius Developer for \$495.00 on Visa, MasterCard, or American Express.

2 Launch the Program...



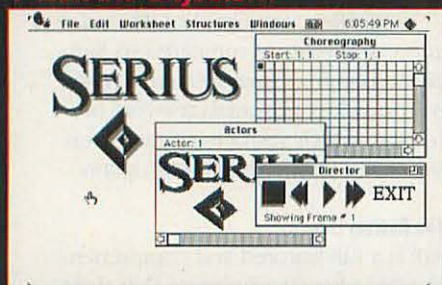
Launch the Serius application, then start your work. You build your programs by clicking and dragging object based icons.

3 Choose the Objects...



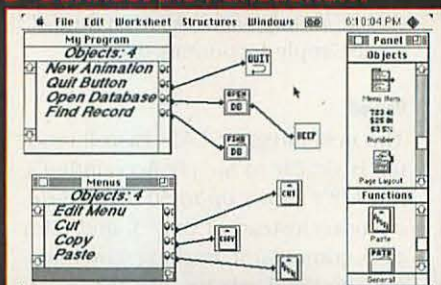
Objects are completely operational, bug free parts of applications. Simply choose which ones you want in your program by dragging them from the library palette.

4 Edit the Objects...



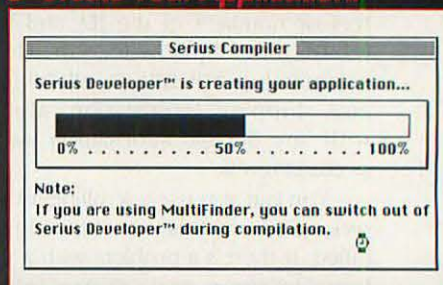
Once you have chosen the objects, simply double-click on each object. Windows and dialogs appear that allow you to set up the objects. The Animation Object is shown here.

5 Connect the Functions...



The functions instruct your program how to operate. Connect functions to a Button Object, for example, instructing your program what to do when the button is pressed.

6 Create Your Application.



Compile your work into a **stand-alone** application in under 60 seconds, with only 25K of code overhead, so your programs are small and efficient.

Watch this corner for information about the Serius Object Library.

Objects Currently Available:

- Animation
- Application
- Browser
- Button
- Calculation
- CD Audio
- Clock
- Connection
- Database
- Date
- File
- File Transfer
- Keyboard
- List
- Menu
- Menu Bar
- Menu Item
- Number
- Painter
- Palette
- Picture
- Printer
- Scanner
- Sound
- Terminal
- Text
- Time
- Window
- Workstation

New Objects for August-October:

- Database 3.0
- Workstation 3.0
- Application 3.0
- Word Publisher
- Spreadsheet
- Graph
- Page Layout
- Bundle

New Objects for November-December:

- Draw
- MIDI
- Cash Register
- Bar Code
- CL/1 Access

SERIUS®



Serius Corporation
1981 East 4800 South
Salt Lake City, Utah 84117
801-272-7788
AppleLink: SERIUS

Macintosh is a registered trademark of Apple Computer, Inc. Serius Programmer, Serius Developer, the Serius logo, and Power Objects are trademarks of Serius Corporation. Serius is a registered trademark of Serius Corporation. ©1990 Serius Corporation. All rights reserved.

Circle 423 on reader service card

★
Arcade Game

WELLTRIS

Pros: Successfully extends the Tetris metaphor; cheery folk music and captivating scenes; very challenging. **Cons:** Steep learning curve. **Company:** Spectrum HoloByte. **Requires:** Mac Plus. **List price:** \$39.95.



Let's start with a warning: If you get caught up in playing a delightful Macintosh arcade-style game, you risk repetitive stress syndrome. After an hour or two of Welltris my neck hurt—from peering into the well—and the muscles in my right hand and arm were ready for physical therapy. So stand up, walk around the room, stretch between games. I mean it.

And Welltris is worth it. A follow-up to the wildly successful Tetris—which was also created by Alexey Pajitnov, of the Soviet Academy of Sciences—Welltris presents a similar mix of cerebral puzzle and reflex-testing action game, accompanied by folk music and intriguing scenes from Soviet life. While you play, the right side of the screen has a changing slide show of scenery and buildings and even rock musicians. The high-score screen shows a jolly family sitting around a big table holding wine glasses up as if to toast the winners.

Playing Welltris

As in Tetris, arrangements of squares—comprising from two to five squares each—are falling. In Welltris your job is to adjust their orientation as they fall so that they fill in the spaces in a 64-square grid at the bottom of a well. The pieces come into the game by sliding down one of the well's four sides. When a piece hits bottom it scoots across to land on the opposite side of the well (unless progress is impeded by pieces already in the grid).

The object of the game is to successfully convey as many pieces as possible to the bottom of the well. When a complete line of eight squares is formed, it disappears, and the adjacent row fills in the space it leaves, as in Tetris. Your score depends on how many lines you make, how fast you

move the pieces, how high you drop the pieces from, and other factors.

At the first level of difficulty the pieces travel down the walls at a stately pace, giving you enough time to figure out how to position them. Keyboard commands move and rotate the pieces. You choose between two move modes: one moves the pieces up and down, right and left; the other moves the pieces clockwise and counter-clockwise. Using the default mode (up/down, right/left), it took me a long time to get the hang of moving around the walls—you have to switch from using the left-to-right keys along the bottom and top walls to using the up-and-down keys on the side walls. As hard as it is to explain or comprehend in words, it's even trickier to actually do. The clockwise-and-counterclockwise move mode seems more straightforward and intuitive.

At first it's relatively easy to fill in spaces on the grid. But it takes a lot of concentration to figure out where a piece is going to end up—and often there are two or three ways to get a piece into a particular space. Just to make things more complicated, if a piece is straddling a corner when it hits bottom it splits into two pieces, each of which zooms off in a different direction. Both of the pieces travel until one of them hits an obstruction; you have to think fast to figure out where they will stop.

As you continue to play, the pieces fall faster and faster. When the bottom of the well is obstructed and a falling piece comes to rest entirely or partly on the wall itself, the wall turns white and becomes inactive—no new pieces will fall down that side, and movement

along that wall is prohibited. A blocked wall is reactivated after three successive pieces (from the remaining walls) have been placed correctly. If all four walls become obstructed, the game is over. The game also ends if pieces are stacked to the top on one of the walls.

Welltris shares one annoying habit with Tetris. At one point—suddenly—even if you start from the simplest beginner's level, the game starts going too fast and the pieces fall with unmanageable speed. Within seconds most players are vanquished; I never got very far past this point (it has taken me about a year to progress past the comparable point in Tetris). A portrait of a beaming Alexey Pajitnov appears on screen just when the game gets near impossible (around 7300 points).

Tashkent Is the Capital of Uzbekistan

Welltris uses an interesting quasi-copy-protection scheme. To begin a game, you must first answer a quiz question about one of the Soviet republics whose flags are pictured in the manual. Unless you are a Soviet scholar, and maybe even if you are, you need a copy of the manual to answer the questions. "What is the population of the republic whose flag is shown below?" asks Welltris, adding helpfully "(answer on p. 12 of manual)." Play enough and you will know the capitals and flags, if not the populations, of Estonia, Azerbaijan, and so on.

This is a tough, demanding game. I don't see it becoming a hit on Nintendo Gameboy or in video arcades. But you never know—my 14-year-old son tripled my high score easily on his first try. —**Felicity O'Meara**

See Where to Buy or circle 871 on reader service card.



Which Way to Go?

While the piece is falling, you decide where to put it and how to get it there. This piece is destined to end up alongside the green and blue squares. You could drop it in place from the side wall or rotate it and drop it from the bottom. At right, a scene from Soviet life: the pizza truck.

Do you have to avoid embarrass

The great technology lottery. You play it every time you buy computer products. Will your investment

connectivity to LAN gateway connectivity.

For starters the same MacIRMA WorkStation™ software that works on MacIRMA 3270 coax adapters works on MacIRMALAN™ Server Gateways, too. All you do is remove the coax board and add a LAN connection and a MacIRMALAN Gateway.

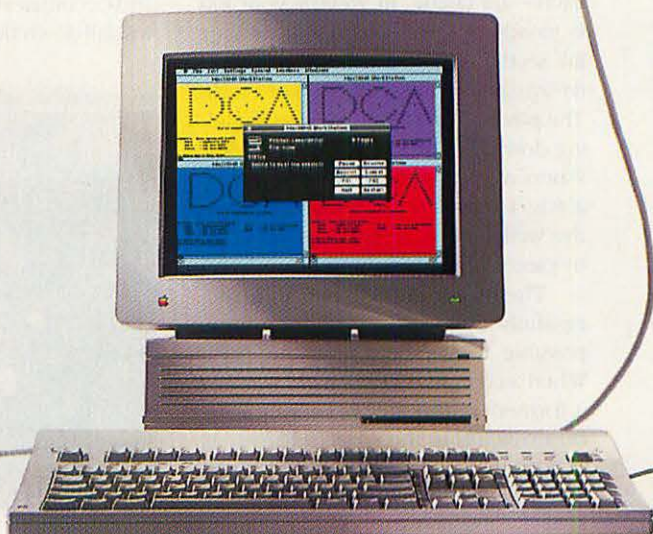
Now your Mac LANs can integrate with a mainframe, keeping your options open in terms of 802.2 or SDLC gateways for TokenTalk, EtherTalk



MacIRMA WorkStation software and MacIRMA hardware provide DFT coax connections for the Macintosh™ SE, SE/30 and NuBus architectures.

today make you look brilliant or foolish when tomorrow comes?

Enter the new MacIRMA® family of connectivity products from DCA. This intelligently conceived product line provides an easy, risk-free migration path from standalone coax Mac to Mainframe con-



the foresight passing hindsight?

No matter what kind of environment you see in your future,



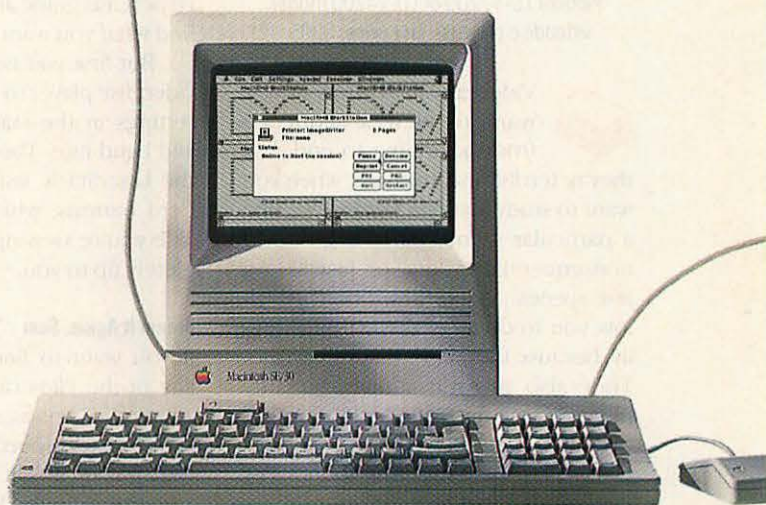
MacIRMA has been the product of choice among customers for over three years.

you can make a commitment to MacIRMA WorkStation today knowing we've been keeping

MacIRMA WorkStation software also talks to a MacIRMALAN 802.2 or SDLC Gateway Server for Token-Ring, EtherTalk and LocalTalk LANs.

or LocalTalk. And reliable, lower cost PCs or PS/2[®]s are used as gateways.

Since the same workstation software is used, there's a consistent user interface from standalone to LAN use, which results in reduced installation and training time. Also, MacIRMA API applications developed for coax work in the LAN gateway environment, so you walk away from none of your investment.



customers satisfied for years. For more information call 1-800-241-IRMA ext. 61G*.

DCA



trademarks and MacIRMA WorkStation and MacIRMALAN are trademarks of Digital Communications Associates, Inc. All other brand or product names are trademarks or registered trademarks of their owners.

Circle 241 on reader service card

★
Interactive Videodisc Packages

DREAM MACHINE: THE VISUAL COMPUTER

Pros: Provides detailed background information and tools for creating custom presentations; video material is entertaining and educational. **Cons:** Some clips are incomplete when called up out of context. **Company:** The Voyager Company. **Requires:** Mac Plus; hard disk; videodisc interface cable; HyperCard. **List price:** Videodiscs \$49.95 each; LaserStack software \$59.95.

MARTIN LUTHER KING JR.

Pros: Videodisc includes a wealth of historical footage; provides hypertext support material and tools for creating custom presentations; documentation includes teaching aids. **Cons:** Expensive. **Company:** ABC Interactive, distributed by Optical Data Corporation. **Requires:** Mac Plus; hard disk with 2MB free space; videodisc interface cable (included for Pioneer LD-V2200 or LD-V4200 model videodisc players). **List price:** \$395.



Videotapes are fine if you want to view a sequence from beginning to end, but they're terribly inconvenient when you want to study just one frame, examine a particular scene, watch a group of nonsequential events, or just skip a few scenes. Videodiscs, however, allow you to do all of these things easily, because they allow random access. They also provide a higher-quality picture using the same kind of optical digital storage technology that gives audio CDs their superior sound. For applications that require nonsequential access to video clips and don't involve recording new information, videodiscs are the way to go.

But the true power of a random access storage device isn't available without a computer to control its logic. That's why the industrial (as opposed to consumer) videodisc players like the Sony 1200 and the Pioneer 4200 have RS-232 interfaces built in. When the appropriate cable connects this port

to one of the Macintosh's serial ports, controlling a videodisc can be as simple as navigating a HyperCard stack.

There are a number of products on the market that take advantage of the HyperCard-videodisc connection. Among the best are those from the Voyager Company and Optical Data Corporation.

Dream Machine

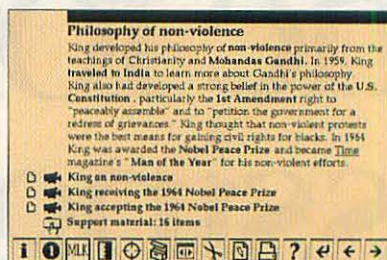
Voyager's Dream Machine package is built around a pair of hour-long videodiscs. Volume I: The Visual Computer is an overview of the uses of computer graphics in entertainment, business, education, science, and graphic arts, with behind-the-scenes looks at how many of these powerful images are created. It's a fast-paced, highly entertaining hour of stunning images accompanied by an electronic musical score. Volume II: Computer Dreams is even more electrifying, with less commentary and longer animation sequences.

Because they're designed to stand alone, it's best to view each disc at least once from start to finish. When you're ready to take a second look at the clips, you can use LaserStack, the HyperCard guide and index, to quickly find what you want.

But first you need to connect the videodisc player to the Mac and adjust settings in the stack for player type and baud rate. The next step is to tell the LaserStack, using familiar HyperCard buttons, which disk and which side you're viewing. The rest is completely up to you.

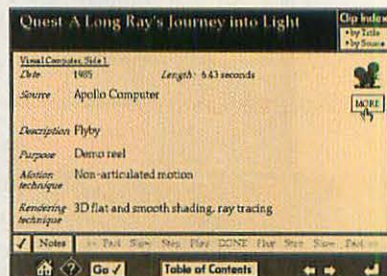
Dream It Again, Sam

If you want to find out more about any of the clips on the disk or view any of the clips again (at regular, fast, slow, or step speed; forward or backward), you can click on the appropriate buttons in the Video Clips section of the stack. You can browse through the clips in order or retrieve them from a Clip Index in which they're sorted either by title or by source. If you prefer, you can see all clips related to a particular topic while listening to the related audio commentary. Or you can use the glossary to learn about a particular graphics technique while viewing video illustrations of that word. The LaserStack software turns the two vid-



Historical Hypertext

The boldface words on this screen are linked to other screens; the list of topics in the center provides access to video clips with corresponding Mac text windows.



Graphic Details

The Dream Machine LaserStack provides information on every clip in easily accessible form.

ediscs into a customizable short course in computer graphics.

As you're exploring clips, you can click on an icon to add the current clip to your personal video clip list, just as you might note a page number of a book for future reference. Whenever you like you can examine, edit, or print your clip list. What's more, you can show all of the clips in your list in order with the click of a button. Working with a clip list is almost like creating your own custom videos.

Of course, you're limited to the material on the discs; and many of the segments, edited to be part of a video collage, seem to be too short and to end abruptly when pulled out of context. Still, the possibilities for teachers and students are staggering.

News, Interactive

Unlike the Dream Machine videodiscs, the discs in the ABC News Interactive series are designed specifically for use with the accompanying HyperCard stacks. ABC's Martin Luther King Jr. package is a good example of the ways computer technology plus video archives can bring history to life.

(continues)

Five lessons other companies have yet to learn about PostScript® printing.

1 *Genuine Adobe® PostScript.®* You need a true Adobe PostScript printer. The Silentwriter2 290 printer from NEC. Some companies emulate PostScript with clone interpreters or add-on cartridges. Others have limited font capabilities. But that's not the way to produce eye-popping newsletters, or 3D charts. We've known this since we introduced our first Silentwriter LC 890 printer back in 1987.

4 *Memory.* With a full 2 MB of standard memory, there's simply no more worry. Since now you have more than enough memory to print a full page of text and graphics (letter or legal size) without losing valuable data. Plus the optional user-installable 2 MB of additional memory satisfies your need to store downloadable fonts and overlays.

2 *MS-DOS® and Macintosh® Connectivity.* That's right, the 290 works with both Macintosh and PC-compatibles. And with its standard Centronics parallel, RS-232C, RS-422 and AppleTalk™ interfaces, the 290 is ideal for stand-alone or network environments.

3 *WYSIWYG Screen Fonts.* As in What-You-See-Is-What-You-Get. Our printer support kit included with every 290 we sell includes software that lets you see all of the printer's 35 scalable typefaces before you print them out. Also included are diskettes that allow you to install the fonts on any Macintosh or under Microsoft® Windows™ in the MS-DOS environment.



5 *Software.* The Silentwriter2 290 is the printer of choice for MS-DOS or Macintosh users working with hundreds of the most popular software packages. With an installed base of over 100,000 Silentwriters, our experience with printer software is hard to beat. Meaning you get more than just a printer, you get answers.

Since NEC began making PostScript® printers, we've learned how to stay ahead of the competition. Sure, other PostScript printers can do some of these things, but only NEC puts them all together in the Silentwriter® 2 290, the printer that goes to the head of the class. To find out more about the Silentwriter2 290, call us at 1-800-NEC-INFO. In Canada, 1-800-343-4418.

LUIS DELGADO



The HyperCard stack is a series of picture menus that enable you to use a mixture of film clips, still photographs, maps, and documents to explore King's life, times, work, philosophy, and impact on civil rights in the United States. The disc is divided into several sections, each of which is controlled by a HyperCard picture menu.

After hearing an optional audio overview by Ted Koppel, you are free to explore the disc. Listen to a portion of a speech on the philosophy of non-violence, for example, then read the accompanying HyperCard screen about King's visit with Gandhi in India, then bring up a map on the video monitor showing the two endpoints of the trip, and so on. Listen to part or all of the "I Have a Dream" speech on the TV while following the text on the Mac screen. You can also take notes on the Mac for future reference. Put together your own minidocumentary from the wealth of materials packed on the disc, and then have them play back in order. You can even switch to the second audio channel, which translates everything to Spanish.

Once you become familiar with the stack's icons and its hierarchical structure, you'll find this package easy to master. My 12-year-old son put together an impressive video collage after just a couple of hours.

Videodiscs for Everybody?

Clearly the market for these packages is limited. Few Mac owners currently have computer-controllable videodisc players attached to TV monitors. But schools and libraries are already putting these videodiscs to work.

Additional innovative packages should be on the way soon. The ABC News Interactive series promises titles on the workings of the U.S. govern-

ment and on AIDS (previewed at the Exploratorium in San Francisco in conjunction with the Sixth International Conference on AIDS), while Optical Data and the Voyager Company have expanding catalogs of HyperCard-controllable educational and entertainment discs. As the demand grows, hardware costs should drop to the point where more families will be able to join the videodisc revolution.

—George Beekman

See Where to Buy or circle 734 (Dream Machine), 812 (Martin Luther King Jr.) on reader service card.

Font-Menu Customizers

ADOBE TYPE REUNION 1.0

Pros: Shortens long font menus.

Cons: Does not work well with merged font files; delays appearance of menus.

Company: Adobe Systems. **Requires:** Mac Plus; System 6.0.2; Finder 6.11.

Hard disk recommended. **List price:** \$65.

FONTINA

Pros: Eliminates scrolling through long font menus; groups all weights, sizes, and styles of a font together.

Cons: When numerous fonts are installed, font menu becomes hard to read.

Company: Eastgate Systems. **Requires:** Mac 512KE; System 6.0.2; Finder 6.1.

List price: \$69.95 each; ten-pack \$295.

MENUFONTS 3.0

Pros: Displays font names using their own (or any selected) screen fonts.

Cons: Doesn't shorten font menu; menu sometimes scrolls slowly.

Company: Dubl-Click Software.

Requires: Mac 512KE; System 6.02; Finder 6.1. **List price:** \$59.95.



Apple broke out of its early 256-font limitation over a year ago when it introduced support for NFNT (New FONT) resources, which gave every Mac the capability of using hundreds, even thousands, of fonts simultaneously. But as scores of new typefaces become available, the shortcomings of the Mac's font-handling methods become in-

creasingly bothersome. The more fonts you install, the longer the font menu becomes. If you need access to most of the Adobe screen fonts (almost a thousand), you feel as if you're watching your life pass before your eyes every time you scroll to find the face you want.

These three products try to improve the look and feel of the standard font menu, each addressing a particular shortcoming. Your own needs and preferences should determine the best product for you.

Adobe Type Reunion

Adobe's new Type Reunion is an INIT that groups all available styles of a font by familiar name in a hierarchical menu. This not only drastically reduces the size of the font menu, but makes it much easier to see and select the exact style you want.

Many typefaces are available in more than the basic plain, bold, italic, and bold italic styles; some have ten or more different styles of varying weights. Until now, Adobe's convention of beginning the name of each variant with an abbreviation representing its style has made it impossible to tell at a glance which font styles, and how many, are installed. For example, the bold versions of Adobe fonts are all preceded by the letter *B* and are listed together on the alphabetized font menu, regardless of the base font's name. Say you have tons of fonts installed, and you want to change Americana Bold (listed as *B Americana Bold*) to Americana ExtraBold (*XB Americana ExtraBold*). You'd have to scroll from one end of the menu to the other, assuming that Americana ExtraBold is indeed available.

Type Reunion reunites what Adobe's naming convention has rent asunder. If you want to select a particular weight of Avenir, for example, you just scroll to the Avenir entry, and select the style you want from Avenir's hierarchical menu (see "Style Hierarchy"). Type Reunion is even smart enough to order styles by weight, with the heaviest on the bottom.

Type Reunion, however, poses a few problems of its own. It won't list styles contained in font families that have been merged using utilities such

(continues)

Save \$23.40



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS

PERMIT NO. 1262

BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Subscription Department

P.O. Box 51666

Boulder, CO 80321-1666



 **File Edit View Special**

**Macworld
Savings!**

49% Off

YES! Please send me a year (12 issues) of MACWORLD for only \$24.
That's almost 50% off the annual cover price of \$47.40.

Name

Company

Address

City / State / Zip

☐ Please bill me. ☐ Payment enclosed.

Allow 4-6 weeks for delivery of the first issue. Basic subscription price is \$30 for 12 issues. The cover price is \$3.95 per issue, \$47.40 annually. For Canada and Mexico, please add \$18 for shipping.

More

**MAC-
power**

**For
You!**

Decisions, Decisions, Decisions.



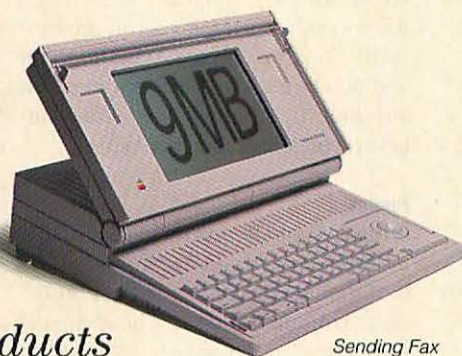
Receiving Fax



Receiving Data



Sending Data



Sending Fax

*With PSI's Portable products
you can choose your upgrade
now and later.*

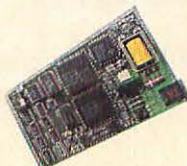
\$695
each
2MB

Memory. You decide. With our
LXPi™ expandable RAM
for the Macintosh™

Portable, you can upgrade to nine
megs now, or later, in two meg
increments. As your needs require.



Telecommunications. You can send
and receive fax and data on your
Portable with PSI's COMPLETE™ 9600



bps fax/2400 bps data modem. The software provided
has options that allow you to send faxes now or later,
when rates are lower.

PSI. The best decision you can make. Now and later.



2005 Hamilton Avenue
Suite 220
San Jose, CA 95125

(800) 622-1722
(408) 559-8544
FAX: (408) 559-8548

AppleLink: PSI

Circle 436 on reader service card

Macintosh Portable is a registered trademark of Apple Computers Inc.

as Fifth Generation Systems' Font Harmony (bundled with Suitcase II) or AlSoft's Font/DA Utility (part of MasterJuggler). So getting the full effect of Type Reunion requires unmerged font files. As a result, many power users who jumped at the opportunity to shorten their font menus by merging font files are now faced with the daunting prospect of creating new, unmerged files of hundreds of fonts. The task is probably worthwhile, though, because Type Reunion consolidates all styles of a font, not just the standard four, and shortens font menus more thoroughly than merging does. And by selecting styles through Type Reunion's hierarchical menus, you never have to worry about choosing a style that's not really there. If necessary, you can still apply standard styling commands to text (handy if you want to change the base font of a document quickly, without finding and changing the font for every instance of bold or italic text, for example).

Type Reunion causes a slight delay whenever you select a menu from the menu bar, even if it's not the font menu. You can bypass Type Reunion and access the standard font menu at any time by holding down the Shift key as you select the font menu.

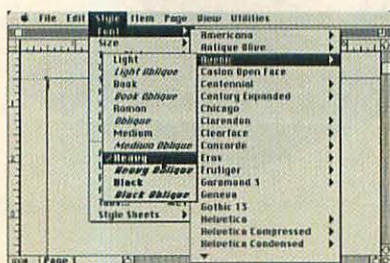
Fontina

Where Type Reunion makes using multiple fonts easier by shrinking the font menu, Eastgate Systems' Fontina version Albuquerque 12 (the company uses names, not numbers, to label versions) does it by enlarging the font menu from a single column to as many columns as are necessary to fit all the available font names onto the Mac's screen at once (see "What You See Is What You've Got"). No scrolling is necessary—you just drag the cursor to the font you want to select.

Fontina is a combination INIT and cdev. You drag it into the System Folder and restart to activate it, then use the Control Panel to configure it and turn it off or on. You can display the menu in any font and at 6, 9, 10, or 12 points—and if you have hundreds of fonts, you'll want to select the smallest size you can read. The standard Apple bitmap fonts generally work best; Geneva is particularly legible at small sizes.

Like Type Reunion, Fontina lists all available styles of a family together, but without the hierarchical menus. This family grouping is not available in certain temperamental programs, such as Microsoft Word.

Fontina displays all active fonts at once, narrowing every column, adding more columns as necessary, and truncating the display of each font's name. This could be a problem as names proliferate, except that as you drag the cursor over the menu, Fontina always displays the full name of each



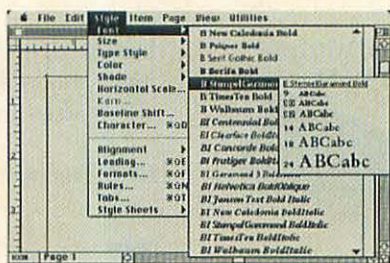
Style Hierarchy

Thanks to Adobe's naming conventions, a font family's styles spread from one end of a font menu to the other. Type Reunion combines all the available styles belonging to one type family into a single, elegant menu entry with a hierarchical submenu listing weights in ascending order.



What You See Is What You've Got

Fontina puts every available font on screen at once, so no font is more than a flick of the wrist away. The font name appears at the top of the screen in the menu's font and its own screen font.



MenuFonts

MenuFonts 3.0 offers a pretty, WYSIWYG display but doesn't address the problem of large, disordered menus.

font at the top of its list, both in the selected font and in its own font, so you can get a preview of each one.

MenuFonts 3.0

Dubl-Click Software's MenuFonts 3.0 is the latest version of one of the earliest enhancements to the Macintosh font menu. Like Fontina, it's an INIT and a cdev, but MenuFonts doesn't affect the size of the font menu, merely its appearance. The cdev lets you specify the exact font and size used to display the name of any font in the menu—usually its own screen font, so you know what a font looks like before selecting it (see "MenuFonts"). You can, however, change the display for letterless fonts like Zapf Dingbats. You can also configure MenuFonts to display a submenu of a selected font at sizes from 9 to 24 points.

MenuFonts 3.0 is compatible with most applications; you can use the cdev to deactivate it if you encounter any problem applications.

Decisions, Decisions

All three of these products are reasonably priced. MenuFonts, while making the menu prettier, doesn't solve the problem of overly long menus with dispersed font-family members. If typographical niceties are your prime consideration, Type Reunion is the obvious choice because of the way it brings order to the most chaotic font menu and clearly presents a font family's relative weights. For the rest of us, Fontina is probably the choice. It combines font-family names, although not quite as elegantly as Type Reunion, and displays font names in their own screen font without MenuFonts' many configuration options. Fontina lets you see at a glance everything that's available to you, and it enables you to select any font with a minimum of mouse travel.

Because Type Reunion and Fontina are reasonably priced and are compatible with each other, you might want to use both together. If you do, you can select Type Reunion's font menu and, by holding down the Shift key, also be able to use Fontina's menu. It's the best of both worlds.

—Eric Taub

See Where to Buy or circle 704 (Adobe Type Reunion), 743 (Fontina), 814 (MenuFonts) on reader service card.

The power to be your best, no matter what you do best.



From the most affordable Macintosh Plus to the awesome new Macintosh IIfx, Macintosh gives you more power to do more things more easily than any other personal computer system in the world. The only question is, how much power do you want?

What a wonderful time to be a human being.
First, they tear down the Berlin Wall.

Then, Macintosh® becomes one of the most powerful personal computer systems in the whole world.

What a great way to start a decade. Humanity is in vogue. *Glasnost* is in the papers. And the computer for the rest of us has become the computer for all of us.

Scientists, engineers, teachers and students. CFOs, CEOs and CPAs. The sales force and the secretarial pool.

Anywhere you find people who prefer actually getting things done instead of figuring out rigid, intimidating computers. Which is to say, almost everywhere.

Why, even other personal computer companies are finally starting to see things our way.

But just as you can't expect the KGB to start picking up Nobel Peace Prizes, you can't expect any other computer to work like a Macintosh.

Only a Macintosh lets you learn the basics of thousands of different programs simply by learning one. So you spend a lot more time actually using your computer. And a lot less time figuring it out.

Only a Macintosh offers a whole family of comput-

ers that all run the same software with the same point-and-click simplicity. So you can buy any Macintosh today, and you won't have to buy new software if you want to move up to a more powerful Macintosh tomorrow.

Only a Macintosh gives you so much power to do so many things so quickly and so easily.

Of course, just as different economic systems can work together to the benefit of both, so too can Macintosh work with the computer systems you have now: IBM mainframes, Digital VAX computers, token-ring networks, other personal computers, you name it.

And with any Macintosh equipped with an Apple® SuperDrive™ disk drive, you can even move information between a Macintosh and an MS-DOS, OS/2 or Apple II computer on a standard 3½-inch floppy disk.

Of course, the best way to understand the power of Macintosh is to sit down and use one.

Then you'll know why Macintosh has the power to change the way you think about computers.

The power everyone in the world can appreciate.

The power to be your best.™



★
Relational Database

FILE FORCE 1.0.1

Pros: Good examples, tutorial, and manuals; good networking features; easily customizable, with a variety of programming facilities. **Cons:** Still more complex than flat-file database managers.

Company: ACIUS. **Requires:** Mac Plus; System 6.0.3; hard disk. **List price:** \$395.

F 4th Dimension is probably the best-known Macintosh database. Part of 4D's fame, however, is its reputation for complexity; it has never been a first choice for database novices with simple mailing-list chores, for example. With File Force, ACIUS hopes to reach a wider market of users who don't require all the facilities and complication of 4D, but who need a networkable, relational database.

4D Lite

Is File Force the long-awaited "4D Lite"? That depends. At one level, it can be used as a straightforward list manager, and there's a mailing-list example that can get you started right away. If you use the program only in this basic way, however, you're not getting much for \$395. At another level, you can make File Force perform a dazzling array of automated custom functions, but you'll have to study the manual's section on "passing values to global procedures using special local variables." Used this way, File Force gives you your money's worth, but it's unlikely that nonprogrammers will be able to puzzle out all the nuances of advanced usage.

Goodies

ACIUS's experience as a Mac database vendor clearly helped design this product. Simply because a relational database with separate data files and structure files takes more planning than a flat-file one, relational databases tend to be a more formidable challenge for beginners. ACIUS has helped flatten this barrier by providing a set of example databases that cover most common applications, from mailing lists and invoices through expense reports and phone messages. Many database chores can be handled directly with

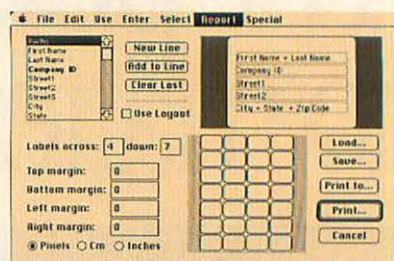
these examples or through a few easy extensions. To keep you happy at the entry level, the program has one of the nicest label-making facilities ever included in a mainstream database product (see "Playing Tag"). If you intend to graduate to a relational database from the flat-file manager you are now using, you can import existing files into the examples (with a bit of tailoring) and may never need to do anything fancier than this.

If you want fancy, File Force can provide that too. Sample layouts to use or modify are also provided in profusion, including multipage data input and output. A palette of drawing tools lets you customize output forms. Forms can include not only the expected PICT files as fields but 8-bit color pictures as well. Output and data reporting are both enhanced by the availability of eight types of File Force-generated graphs, updated with each change in data. Since you can write scripts to automate common functions (validating data entry on input layouts, for example), File Force offers not only buttons for running the scripts but a selection of nifty clip art buttons. There are also Global, Layout, and File procedures, produced with a procedure editor that contains the equivalent of a menu-driven modern programming language.

Sure and Fast

File Force has two more desirable traits: there's a complete security system and respectable search-sort speed. Security proceeds through Designer, Administrator, Owner, and User/Group levels, delimiting authority to change data, layouts, report forms, and passwords on a multiuser system. As a network product File Force is perfectly straightforward, requiring only that you buy a copy of the program for each participating Mac and keep your data files on the network server (and structure-file copies on each local hard disk).

File Force 1.0.1 posted faster results on most types of searches than 4th Dimension 2.0 itself, although 4D version 2.1 will use the new database-engine tricks already included in File Force. This means, approximately, that simple searches over 1000 records take four to six seconds, depending on the



Playing Tag

File Force does a spectacular job of label management, a function that seems humdrum but is often crucial to practical use of a database. You can customize and preview label formats with a few simple feature selections.

data. Curiously, complex searches using logical conditions and "contains" instead of the equal sign (=) were as fast or faster. Users who are accustomed to the nearly instantaneous search results seen in the leading flat-file managers (FileMaker II, Panorama, Microsoft File) or in relational speed demon FoxBase+/Mac may find this poky, but it means that throughput won't be a serious problem except for data files larger than 20,000 or so records.

File Under...?

Most Macintosh users who want a database for a single computer don't need all the features of a relational database. Conversely, Mac users at large corporations will find that a relational database like File Force doesn't offer enough (there's no way to program connectivity, for example). File Force is an appealing package for a small office with three to six connected Macs. At this level, a relational database is important; but simplicity is equally important in practice, since there usually isn't a programmer available. Unfortunately, there is probably a certain population of 4D purchasers in this small-office setting that would have been better served by File Force, if it had been available. Although ACIUS can't make the inherent conceptual work of relational-database design disappear altogether, the examples, tutorials, and documentation in this package make you believe you're more likely to succeed in automating a small-office work load with File Force than with its big brother 4D or with 4D's competitors.

—Charles Seiter

See Where to Buy or circle 741 on reader service card.

SUITCASE II:

*A Matter of Being
In the Right Face
At the Right Time*

Suitcase II is the award-winning software that gives you unlimited access to *all* your fonts and desk accessories, *all* the time. Without having to use Font/DA Mover to install and deinstall them. Without cluttering up your system file.

Suitcase II lets you view an unlimited number of fonts *in their own typefaces* at any moment, so you can pick the right face at the right time, without breaking stride. You'll never have to reboot your Macintosh to install a new font, or search through a cluttered System File to find what you need. Font ID conflicts are a thing of the past with Suitcase II.

And you'll never have to restart your system to install a Desk Accessory, because whatever you need will be right in your face, whenever you need it!

So why spend your time juggling fonts and DAs any longer? Now is the time to put Suitcase II on *your* Macintosh!



FIFTH GENERATION SYSTEMS

10049 N. Reiger Road Baton Rouge, LA 70809 (504) 291-7221

For a complete list of features and specifications, or the name of your nearest dealer, call 1-800-873-4384. Circle 250 on reader service card

★
File- and Text-Finding Utility

ON LOCATION 1.0

Pros: Fast; easy to use. **Cons:** Nonstandard user interface; background indexing needs improvement. **Company:** On Technology. **Requires:** Mac Plus; System 6.0. **List price:** \$129.95.



Information is useless if you can't find it. As hard disk capacity has increased, being able to locate data on the disk has become more difficult. And often, finding files just isn't enough; you need to find text within documents. On Location, the first product from On Technology, is a desk accessory that finds files by name and finds text in files, at speeds that are nothing short of incredible. And once it finds what you're looking for, you can view, copy, and print the document from the DA.

Setting up On Location is easy. You simply copy three files and a folder into the System Folder on the hard disk and use Font/DA Mover to install the On Location desk accessory. You can, if you prefer, access the DA with Suitcase II or MasterJuggler. Restarting completes the installation.

After opening the On Location DA, you select Create Index from the On Location menu. First-time index creation can take a fair amount of time, especially if you have more than one hard disk. The program indexed file names and text in files on my 140MB hard disk (133MB used, 1505 files in 187 folders) in just under 33 minutes. The size of the index was 438K, well under the 2 percent index size On Technology says is typical (partly due to the fact that there are more applications than documents on my disk).

Zeroing In

You can choose to search for file names or for the text in files. If you don't enter any search text, On Location finds all files; but as you enter search criteria, it narrows the search with each keystroke. You can further narrow the search criteria using pop-up menus; when searching for files by name, you can search for files that contain, match exactly, start with, or end with the search criteria. When

searching for text in files, you can tell On Location to look for exact matches or text that matches the root of the search text. This feature usually worked well, but it could use some improvement. When I searched for *run* with root matching, On Location found files that contained *running*, but not files that contained *ran*. Past-tense forms of words were usually missed by the root-matching option. The program never took more than a few seconds to find by file name, and searches of text in files were invariably complete within ten seconds.

As On Location finds files, it adds the results to its own file list. Double-clicking on a file in the file list opens a View window that shows the contents of the file, which can be copied to the Clipboard. You can also find other text within the View window using the Find and Find Next buttons. On Technology has licensed Claris Corporation's XTND file-reading technology, which allows you to view the text in the original fonts and styles, whether or not you have the application that created the file. On Location ships with file readers for 14 Mac and IBM-PC applications; text from other applications is displayed in 9-point Geneva. From the file list, you can also print, copy, move, delete, and rename files and create new folders.

Interface Wars

Despite its ease-of-use, On Location is certain to annoy Macintosh-interface purists. It uses window, button, and dialog-box treatments that are reminiscent of the Next computer system. What's worse, by creating its own windows and buttons, On Technology has made On Location incompatible with

some common utilities. For example, my Page up and Page down QuickKeys don't work with On Location's non-standard scroll bars. User-interface innovations should be applauded when they result in bringing better ways of doing things to the desktop, but On Location's interface is a triumph of style without any added substance.

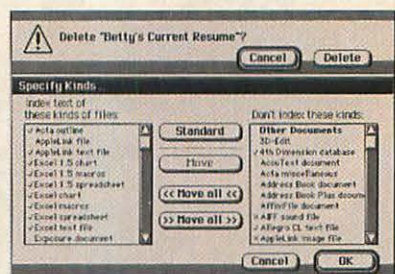
Finding Faults

On Location has a few minor quirks that should be addressed. The current version doesn't always find numbers, although combinations of letters and numbers seem to work fine. Automatic updating of indexes in the background is designed to occur when the Mac isn't busy. Unfortunately, the program's definition of busy includes only keyboard use, mouse movements, and times when the menu bar is highlighted (some applications highlight the File menu while printing, for example). Serial-port activity isn't taken into account by On Location. So if you're using a modem to download information when On Location begins updating automatically, the transfer speed is significantly reduced—costing you time and money. It's possible to turn the Autoupdating feature off, but doing so before every online session is inconvenient. On Location should check to see if serial ports are in use before it begins background operations and delay updating if they are.

Like many other new programs, On Location's performance suffers in low-memory environments. Creating indexes and autoupdating on a 1MB Mac can be very slow, although finding files is acceptably speedy. Apple has stated that 2MB of RAM will be required to use the upcoming System 7.0, and it is apparent that many software manufacturers are already optimizing their programs for Macs with more than 1MB of RAM.

Stacked up against On Location's strengths, however, these problems are not terribly important. It's an inexpensive utility that's easy to use and works exceptionally well. It far outdistances its competition in speed, does things that no other utility does, and brings the functions of several utilities together in one well-thought-out package.—Tom Negrino

See Where to Buy or circle 825 on reader service card.



Next Window, Please

As these dialog boxes show, On Location shows a unique face to the world. It's not necessarily a better face, just different.

New Adobe® Emerald RIP Boosts PostScript® Productivity

Varityper's Modular Series 4000 Lets You Buy What You Need When You Need It

If you buy Varityper's Series 4000 imagesetting system now, you have the option to upgrade easily in the field to the new Emerald RISC processor when you need it.

The modular Series 4000 secures your investment. You buy only what you need, when you need it. You can take advantage of our "Emerald Upgrade Policy" as your needs change, and not have to replace your entire imagesetting system.

Varityper's Series 4000 combines high quality photo output, high resolution plain paper proofing, and our time-saving Instant Replay feature.

Our high resolution plain paper proofs are faithful to final output—so your photomedia "final" take is more likely to be the final take, saving substantial time, material and processing costs.

Varityper's Instant Replay feature lets you re-image without re-RIPing! Jobs requiring multiple repro's, those which the processor "ate", or those requiring imaging at another density can be re-run at full recorder speed.

For complete details on Varityper's Emerald Upgrade Policy and its award-winning PostScript imagesetters, call:

1-800-631-8134

(In New Jersey, call 201/887-8000, Ext. 999)

Varityper is a registered trademark of Varityper, Inc.
Adobe and PostScript are registered trademarks of Adobe Systems, Inc.



Varityper

a Tegra Company

11 Mt. Pleasant Ave., East Hanover, NJ 07936

Circle 93 on reader service card



We're Number One When it Comes to Data Storage Products!

Macintosh Family Compatible:

Hard Disk Drive Systems to 2,022 MBytes

Rewritable Optical Systems to 600 MBytes

SyQuest Removable Cartridge System

DAT Backup Systems to 1.3 GBytes

Streaming Tape Backup to 525 MBytes

AppleTalk, TOPS and NetWare Compatible

NuPORT SCSI-2 Synchronous DMA Host Card

Proud member of
abcd
The Microcomputer
Industry Association





Where Else Can You Find One Source For All Your Data Storage Needs?

MicroNet builds innovative and award winning Macintosh storage systems, from 20 to 2,022 MBytes, with performance to match a wide range of applications.

Included are high-speed internal and external hard disk drives, fast as 5.4 ms. Powerful and easy to use streaming tape backup systems and the latest in rewritable optical disk drives.

MicroNet will simply never build an average product.

Our engineering and marketing departments listen to the specific needs of our users. We take their ideas and develop them around the latest technology to obtain the most productive and reliable data storage systems to be found.



The result is a complete line of storage systems to match a wide variety of needs.

Attention to detail is one reason why MicroNet has consistently earned high marks from industry experts and more importantly from our customers around the world.

MicroNet is noted for superior quality and excellent technical support. Our engineers continually test and update our products to ensure compatibility with Apple's latest System Software. When it's all said and done, MicroNet storage products are simply the finest that money can buy.

For more information and the location of an Authorized MicroNet Dealer in your area, call our sales department at 1-714-837-6033.

HiPORT is a trademark of MicroNet Technology, Inc. All other product names are trademarks of their respective holders.


MicroNet Technology, Inc.

20 MASON • IRVINE, CALIFORNIA • TEL: (714) 837-6033 • FAX: (714) 837-1164

Circle 275 on reader service card

★
CD ROM Drives

CD TECHNOLOGY PORTA-DRIVE

Pros: Good access time; transportable.

Cons: No audio-out jacks; cumbersome volume control; no power indicator; required cables cost extra. **Company:** CD Technology. **Requires:** Mac Plus; System 6.0. **List price:** \$895; bundled with Microsoft Office CD ROM \$1295.

NEC INTERSECT CDR-72

Pros: Good audio facilities.

Cons: Slower than the other drives; required driver software costs extra. **Company:** NEC Technologies. **Requires:** Mac Plus; System 6.0. **List price:** \$999; driver software \$99.

TXM-3201A1-MAC

Pros: Good access time. **Cons:** No audio-out jacks; cumbersome volume control; no power indicator; required cables and software drivers cost extra. **Company:** Toshiba America Information Systems. **Requires:** Mac Plus; System 6.0. **List price:** \$995; Macintosh-compatibility kit \$130.

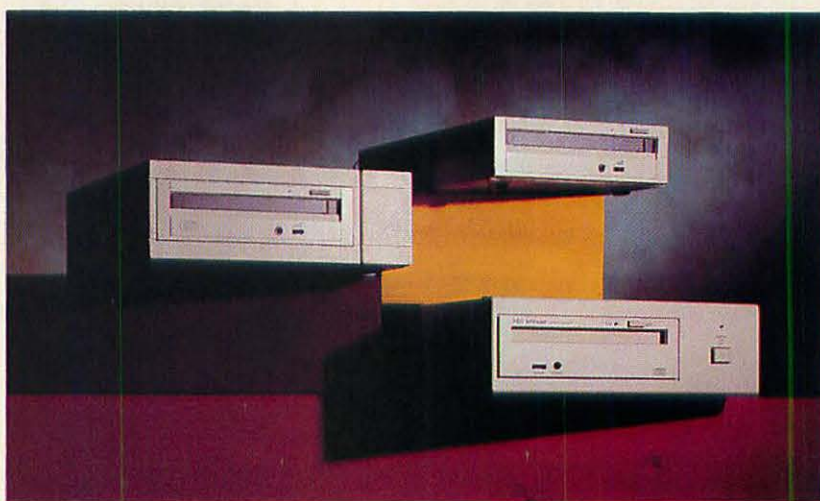


Apple led the way with CD ROM in the Macintosh world by introducing the AppleCD SC player in 1988; it was a good drive that had the usual Apple drawback—it was expensive (\$1199). As CD ROM has gained in popularity, Apple has dropped the price on its drive to \$899 and several third-party drives have come on the market.

I evaluated three of these new drives, from Toshiba, CD Technology, and NEC, and discovered that you can now buy better performance than Apple's for the same price. My pick, the CD Technology Porta-Drive, is smaller, faster, and portable, yet costs the same as the AppleCD SC, although at the cost of some convenience features.

Toshiba TXM-3201-A1

Toshiba's CD ROM drive is a compact unit with a footprint that's about the same as that of a Mac SE. It has a



The CD Technology Porta-Drive (top), the TXM-3201A1-Mac, and the NEC Intersect CDR-72

minijack on the front panel for headphones, and a three-position volume-control switch, which lets you choose between quiet, OK, and a bit too loud. A rotary volume dial would be much better. The front panel also has a drive-access light and an eject button, which is disabled by the software driver.

Missing is a power-indicator light. As it is now, the only easy way to tell that the drive is on is by pushing a CD into the unit; if it slides in easily, the drive is on. The drive has no preamp audio-out jacks; so to use the drive as an audio CD player, you have to use headphones or an adapter with your speakers.

There are two SCSI connectors on the rear panel, the drive is not terminated, and the SCSI ID can be changed via DIP switches. The drive requires an expensive (\$130), separately priced Macintosh compatibility kit, which consists of the driver software and the necessary SCSI cables.

Toshiba doesn't write its own software drivers, it purchases them from OMI. The version I reviewed, 1.2, worked fine for the most part, but has a bug that prevents it from seeking and accessing a portion of an audio CD longer than one hour. The driver ignores requests to seek to positions higher than 60:00; although if you start playing before the 60:00 mark, it will continue to play through just fine. Another drawback of the 1.2 driver is that it will not mount a CD ROM as an AppleShare volume. At press time Toshiba had promised to ship a bug fix by fall.

The Toshiba and CD Technology drives share the same Toshiba drive mechanism, and this mechanism is the winner in speed tests among currently shipping CD ROM drives, easily beating drives from NEC and Apple. An average hard disk, however, delivers access times of 28 milliseconds; a blazingly fast CD ROM unit's access time is measured in *hundreds* of milliseconds. I used two simple, real-world tests: copying a large (4MB) HyperCard stack to a hard disk, and opening the same stack from the Finder. I did each test several times, with the Mac's RAM cache turned off.

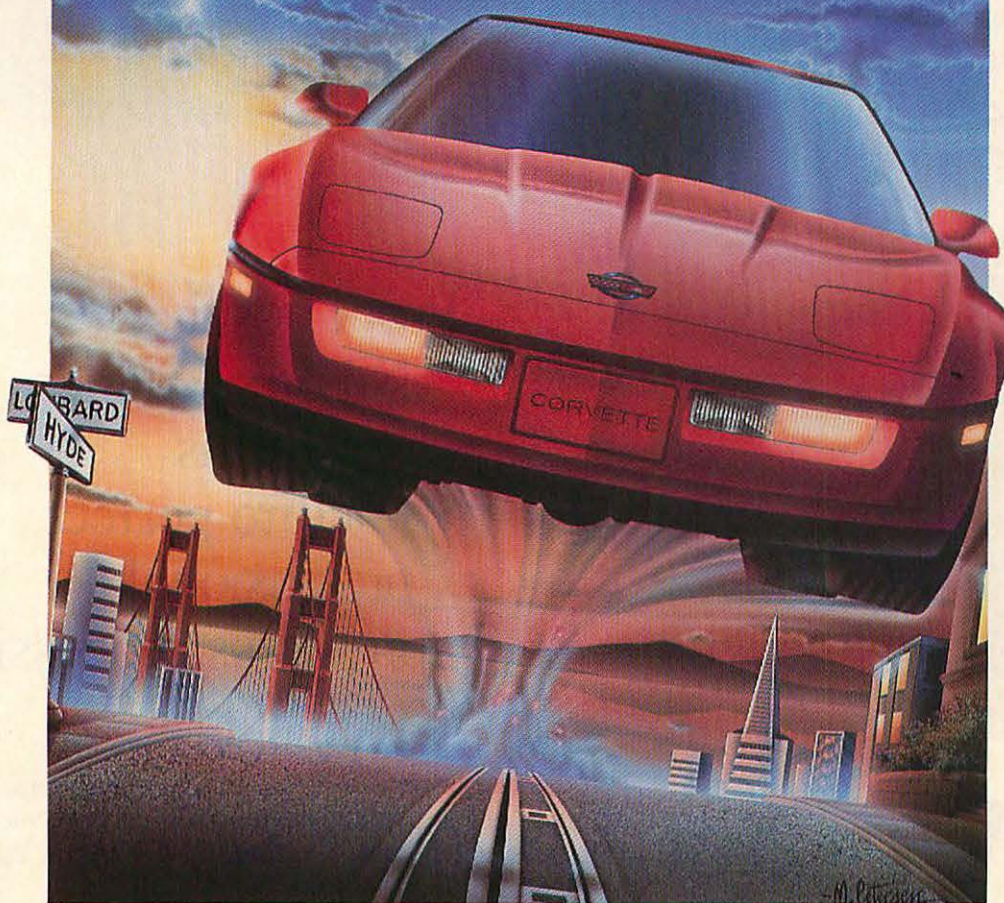
CD Technology Porta-Drive T3201

As its name says, the Porta-Drive is designed to be carried with you. It's the smallest and lightest of the three drives tested, partly because the AC power supply is a separate box that you plug into the drive's rear panel.

The Porta-Drive shares the same drive mechanism as the Toshiba, hence the same performance figures. However, the Porta-Drive comes with a later version of the OMI software driver (1.3), which allows it to randomly access an audio CD longer than 60 minutes and fixes the AppleShare problem. At press time, CD Technology stated that it plans to revise its drive hardware to include stereo preamp jacks, a push-button SCSI-ID setting switch, and a power indicator.

Disappointingly, CD Technology sells the SCSI cable and terminator separately for \$40, rather than including (continues)

VETTE!



PACKAGE INCLUDES
BEAUTIFUL MACINTOSH II COLOR
AND MACINTOSH BLACK & WHITE VERSIONS.

IT'S RED HOT!

With **VETTE!**™ Spectrum HoloByte™ has just established the new standard for car racing simulations. We have taken our award-winning **FALCON**™ simulation technology from the sky and put it on the streets in **VETTE!** Nothing else compares. Dare to test your racing skills against sexy European sports cars through the streets of San Francisco past famous landmarks, dodging traffic and pedestrians, flying up and down those steep San Francisco hills. Why limit yourself to

boring race track or freeway driving simulations when you can thrill to the chase through one of the most alluring cities in the world. **VETTE! – THE NEW STREET RACE SIMULATION!**

FEATURES:

- Outstanding 3-D solid modeling graphics
- Accurate mapping of San Francisco streets and landmarks
- Option to choose from 3 Corvettes (1989 stock model, ZR1 King of the Hill, or the Calloway

Top Gun with corresponding unique features)

- Real maneuverability including U-turns
- Test performance factors of each Corvette on a dynamometer
- Amazing realism in terrain and buildings
- Varying difficulty levels
- Landmark to landmark courses (You select the best route.)
- Multiple view perspectives (helicopter, front and side)



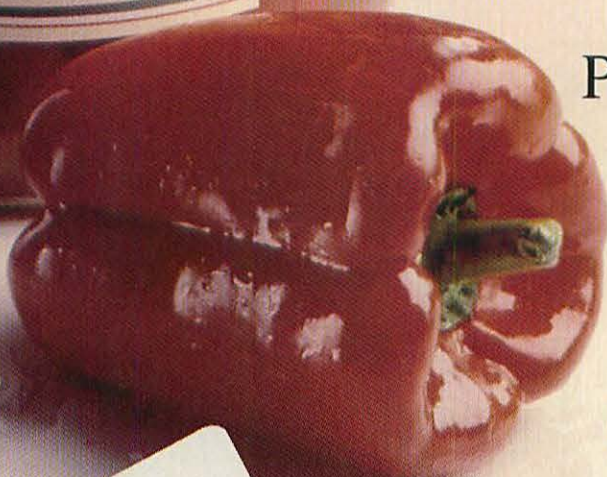
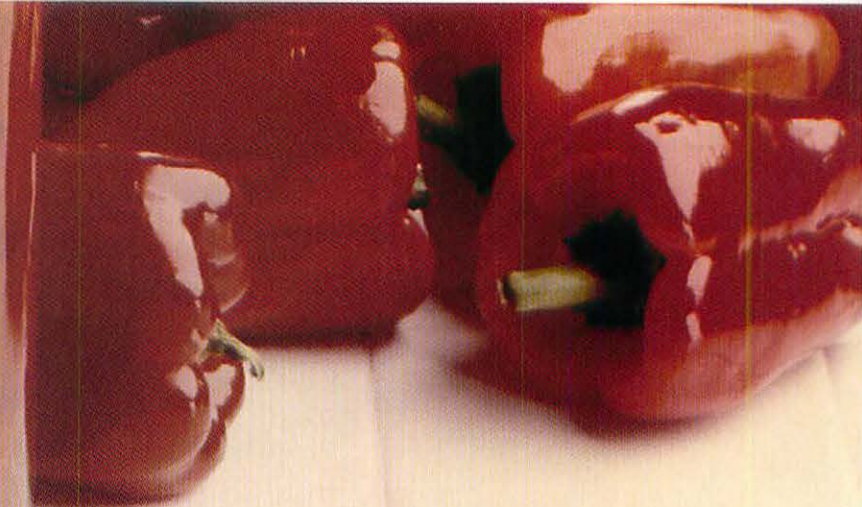
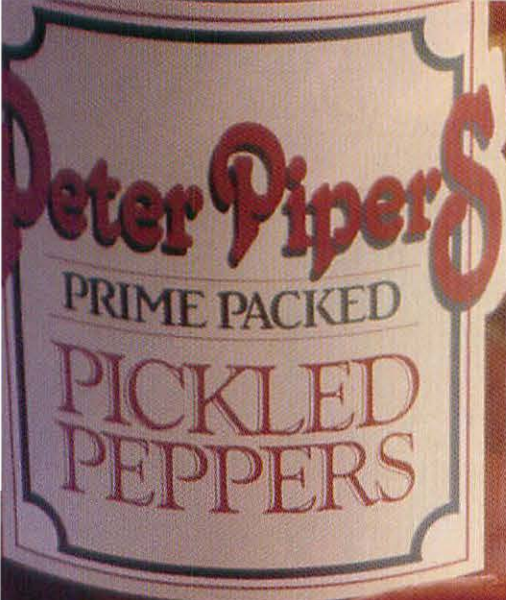
Spectrum HoloByte™

A Division of SPHERE, INC.

2061 Challenger Drive Alameda, CA 94501 (415) 522-0107

Available on Macintosh/Macintosh II color and IBM.

Screens shown are Macintosh and Macintosh II. VETTE!, FALCON, and Spectrum HoloByte are trademarks of Sphere, Inc. Other products are trademarks of their respective holders.



Proof positive...
Nikon's scanner
performs
picture perfect,
professional
pre-press processing.

Whether you're already doing pre-press processing on your desktop publishing system, or are thinking of getting into it, or just want precise color control of the pictures you send to your outside separator, the Nikon LS-3500 Film Scanner is hot stuff.

This high quality scanner is packed with prime performance features—working with 35mm positives or negatives, it provides an unprecedented 25 million, 24-bit pixels of resolution. That means it can accurately reproduce every subtlety of color with crisp, breathtaking detail. Its proprietary color separating software is perfect for a Mac® II, any MS-DOS® or UNIX®-based system. The on-board intelligence makes it easy for anyone to use. And it's compact and economical—no competing system performs anywhere near as well for anywhere near the price.

Oh, yes—where's the proof positive? This complete page is peppered with it. (Scanned and separated by the Nikon LS-3500 from a photo shot by Michael Pruzan with a Nikon camera.) Impressed? Phone or write for complete details: Nikon Electronic Imaging, Dept. EB-1, 101 Cleveland Ave., Bayshore, NY 11706, (516) 222-0200 Ext. 324. Or call 1-800-NIKON-US for the dealer nearest you.



©1990 Nikon Inc.

Nikon
ELECTRONIC IMAGING

Mac® II is a registered trademark of Apple Computer, Inc. MS-DOS® is a registered trademark of Microsoft Corporation. UNIX® is a registered trademark of AT&T. Kodachrome is a registered trademark of Eastman Kodak Company.

Circle 258 on reader service card

ing it with the drive, although driver software is included with the player. An optional \$200 battery pack and a \$60 carrying bag are also available.

The \$895 Porta-Drive is offered in a bundle with the Microsoft Office CD ROM for another \$400. The CD ROM includes Microsoft Excel, Word, PowerPoint, and Mail, plus an extensive HyperCard-based documentation system, a complete set of Adobe screen fonts, and megabytes of other goodies (see *Macworld*, *Reviews*, June 1990.) Microsoft Office lists for \$949, so bundled with Porta-Drive it's a great deal. CD Technology has extended this offer indefinitely but could change this policy at any time, so check with the company before you buy.

NEC Intersect CDR-72

The NEC CD ROM drive is nicely designed, with a front-panel headphone jack and a rotary volume control that's much more convenient than the three-position volume switch on the other two drives. It also has a power switch and a power indicator on the front panel. The rear panel sports audio-out jacks, a switch to set the drive to accept either 110 or 220 volts, a set of DIP switches that set the SCSI ID, and the two SCSI connectors. The drive is not terminated.

NEC, however, sells the driver software necessary to use the CD as a \$99 "option"—a disadvantage, since there is nothing optional about it. This package includes the driver software and Music Box, an application or DA (both are supplied) that plays audio CDs,

although the NEC driver also supports Apple's Audio CD Access INIT and CD Remote DA.

The NEC drive was quite a bit slower than the other two, taking twice as long to open my HyperCard test stack (the Communications stack from Brøderbund's *Whole Earth Catalog* CD). NEC's stack-copying speed was also slower than the other drives' (see "CD ROM Drives Compared").

The Final Spin

The state of the CD ROM drive market seems to be much like that of Macintosh hard disks a few years ago. Because there aren't that many to choose from, manufacturers can get away with charging extra for required components like driver software and SCSI cables. And prices for these drives are still high.

The NEC drive wins points over the Toshiba and CD Technology units for its better audio facilities, but falls to the rear of the group because of its slower speed and expensive "optional" software. The Toshiba and CD Technology drives are both good units, but I'd pick the CD Technology unit by a nose because it's less expensive, can be made portable with the accessory battery pack, and takes up less space when it's on the desktop. And if you need the applications in Microsoft Office, the Porta-Drive's bundling offer makes it an excellent value.

—Tom Negrino

See Where to Buy or circle 715 (CD Technology Porta-Drive), 819 (NEC Intersect CDR-72), 859 (TXM-3201A1-Mac) on reader service card.

★ CD ROM Dictionary

WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY, CD ROM EDITION

Pros: Contains complete text of *Webster's Ninth New Collegiate Dictionary*; plays recorded pronunciations for all words in main dictionary; networkable (with multiple copies or site license). **Cons:** Does not operate with word processors; requires 770K MultiFinder partition; poorly designed, often frustrating interface. **Company:** Highlighted Data. **Requires:** Mac Plus; CD ROM drive. **List price:** \$199.95.



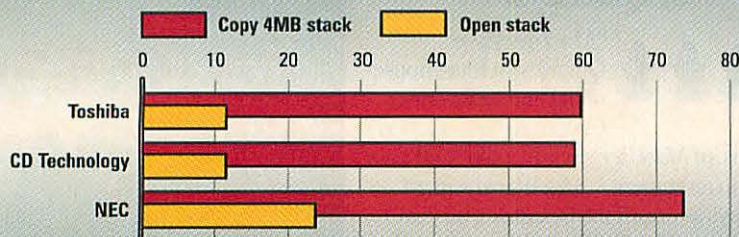
Like everyone else who's shelled out some money for a CD ROM drive, I've been waiting for a product that justifies all the hype (and expense). In my case, I keep looking at my volumes of writer's reference books and wondering when I'll be able to replace them with a single, well-designed, carefully integrated CD. Thus it was with some anticipation that I received the Webster's Ninth New Collegiate Dictionary, CD ROM Edition. Although the disc is the electronic equivalent of just one reference book, it is the first complete dictionary for the Macintosh in any medium, and I was eager to see how well it fulfilled its CD ROM potential.

Webster's Ninth

Webster's Ninth is composed of the CD ROM disc itself and the engine that runs it. The disc contains an exact copy of the print edition of *Webster's Ninth New Collegiate Dictionary*, published by Merriam-Webster, with complete entries (including pronunciation, etymology, definitions, and examples), all illustrations and tables, a style manual, a list of U.S. and Canadian colleges and universities, and dictionaries of abbreviations, geographical locations, foreign words and phrases, and biographical information, plus recorded pronunciations for the words in the main dictionary. All of this is quite a bit more than the nearest competitor in Macintosh online dictionaries, Deneba's *Spelling Coach Pro* (continues)

CD ROM DRIVES COMPARED

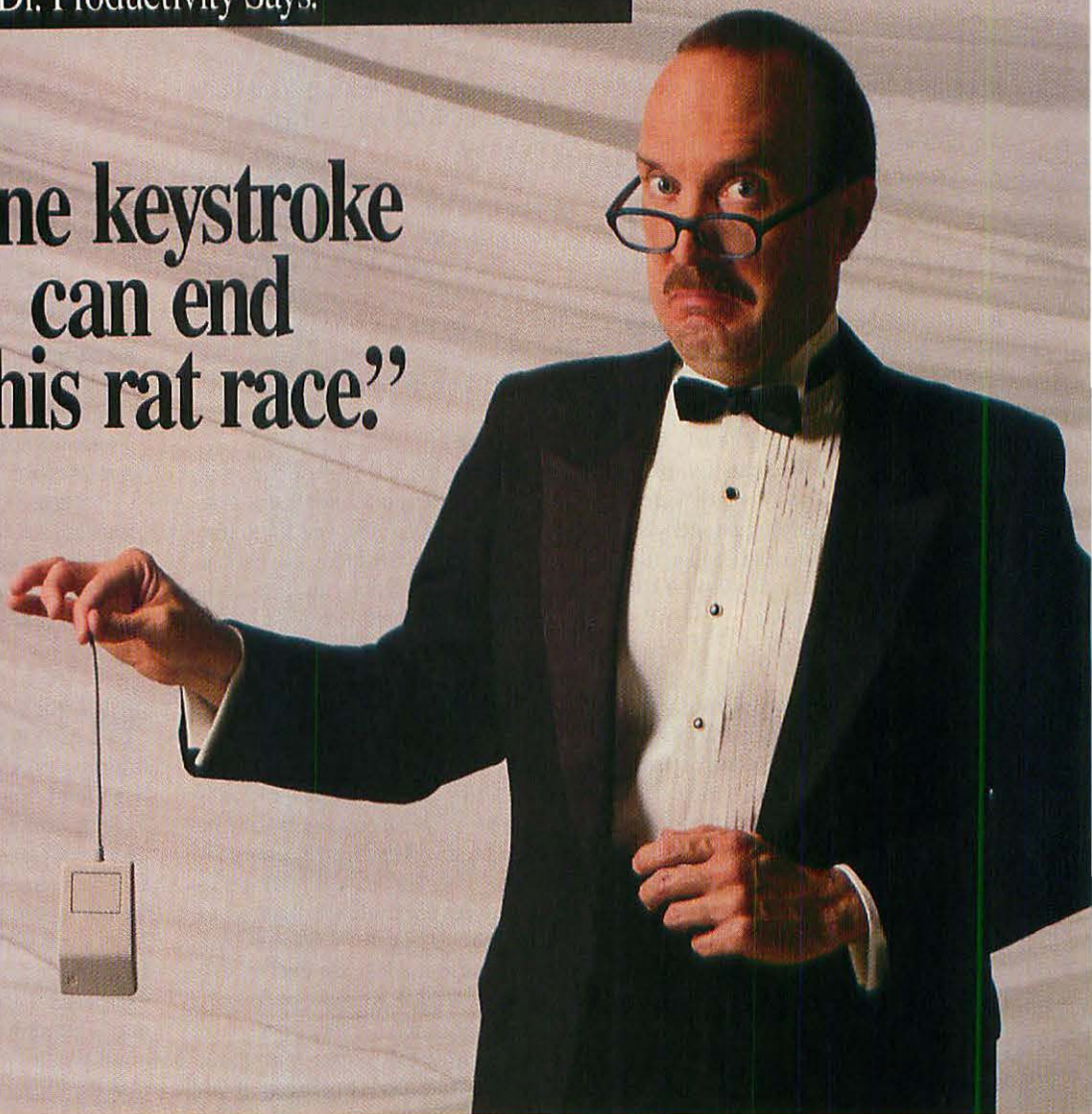
Measured in seconds



The Toshiba and CD Technology drives, both based on the same Toshiba drive mechanism, were notably faster than the NEC drive, which took twice as long to open the HyperCard stack.

Dr. Productivity Says:

**“One keystroke
can end
this rat race.”**



**“If you want finger exercise,
play the piano. If you want
productivity, use QuickKeys.”**

“Want to know why users and reviewers love QuickKeys so much? Because an active computer user will stroke the keys over 1.5 million times – and race the mouse endless miles each year. QuickKeys is a fast, simple way to eliminate the *boring, repetitive* keystrokes you do over and over – and delete hours of *tedious* menu yanking from your life every year.

Sure, you increase productivity and save time. Big deal. The *real* value is all the little shortcuts that make computing so much more tolerable.”

**“QuickKeys makes your Mac
do the walking.”**

“It lets one keystroke eliminate a lot of mousing around. Have one QuickKey

launch a program or set up a page. Define keys that enter entire paragraphs, or insert addresses, names or formulas. Anything you do repetitively, you can do in less time, with less aggravation. A stroke of genius.”

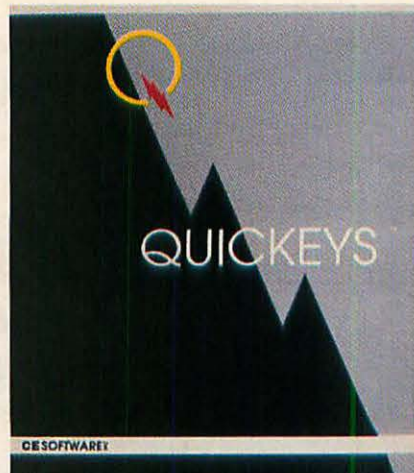
**“Reviewers have spared
no keystrokes in praise
of QuickKeys.”**



“MacUser gave QuickKeys a four-mouse rating and an Editor's Choice Award. Robert Wiggins, of MacUser, says 'It could send your mouse to retirement.' MacWorld named QuickKeys as one of the Goodies You Can't Be Without. MacGuide readers awarded it the Golden Gavel. Byte says, 'QuickKeys is right up there with sliced bread, the Great Pyramid of Cheops, and other wonders.' The raves go on and on.”

“Go to a dealer and try it.”

For the Macintosh®. Suggested retail price, Version 1.2: \$99.95. For free literature and Where To Buy: 1-800-523-7638, Dept CE 33.



CE SOFTWARE INC.

CE Software, 1854 Fuller Road, P.O. Box 65580, West Des Moines, IA 50265 USA. Dr. Productivity and QuickKeys are trademarks of CE Software, Inc. All other registered and unregistered trademarks are the sole property of their respective companies.

Circle 130 on reader service card

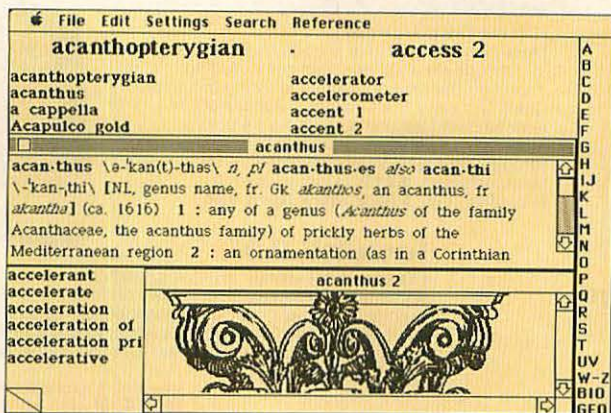
fessional, which contains no pronunciation guide (written or spoken), etymology, or examples. On the other hand, for about the same price, Spelling Coach Professional includes a name-brand, online thesaurus and spelling checker.

The engine that puts Webster's Ninth on screen and plays the recorded words is a stand-alone application provided on an accompanying floppy disk. Your print dictionary doesn't force you to clear everything off your desk each time you use it and neither should an electronic dictionary, but this one does. If you are running under the Finder, you must quit the program currently running and launch the dictionary just to look up a word. If you are working under Multi-Finder, you can run the dictionary as well as other programs and switch between them. But since Webster's Ninth requires a remarkably greedy 770K, your Mac must have at least 2MB of RAM to be able to run it.

Poorly Designed

The main window of Webster's Ninth is a two-column listing of the words—without definitions—in the currently selected dictionary (the main dictionary or any of the secondary dictionaries). You can thumb through the list page by page (as if browsing printed pages) in any of the dictionaries. You can also skip forward or back to the start of a specific letter in the main dictionary. Although the main window may be useful to browsers and encourage the kind of discoveries that often occur in print dictionaries, it is poorly designed: there is no indication anywhere of which dictionary is in view (you have to figure it out from the words in the list); the window itself cannot be moved, resized, or closed; you cannot skip to a specific letter in any of the secondary dictionaries, which makes word lists for these dictionaries difficult to flip through quickly; the biographical dictionary lists only last names; and in standard-size type (you can set the program to display all text windows in standard or large type) there's way too much wasted space.

The definitions themselves are stored in separate windows. To open a definition window, click on a word



The Definition Window

A definition window in Webster's Ninth opens atop the main word list. Definition windows are relatively narrow and, frustratingly, cannot be resized; you must scroll long definitions to see them in their entirety.

in the main window or use the dictionary's Find command. It can search one or more dictionaries in a single sweep and can recognize irregular verb forms (it will tell you to look up *see* if you ask for *saw*, for example). But surprisingly, if you enter an incorrectly spelled word, and frequently if you ask for a regular verb form such as *searched* instead of *search* or the plural form of a noun, Webster's Ninth won't even hazard a guess. Instead, it merely scrolls to the word-list page containing the closest match and leaves the rest up to you. Also, the Find command searches only for words in the main word-list window; it won't search for words contained within a definition (such as all entries with *success* in the definition) or for etymology (such as all words based on *machina*).

When a definition window opens, the Mac plays the recorded pronunciation. If a table or illustration is connected to the entry, separate windows for these open as well. Illustration and table windows can be resized; but when you zoom in on them, they fill the entire screen and cover the definition window).

You can click on any word in a definition and use the Find command to open its definition window (see "The Definition Window"). Also, you can copy and paste any illustration and part or all of a definition into another application (a copyright notice is added automatically where you paste). However, you can open only one definition window at a time, and although you can easily move to the next or previous definition in the word list, there's no trail to take you back through previously opened definition windows.

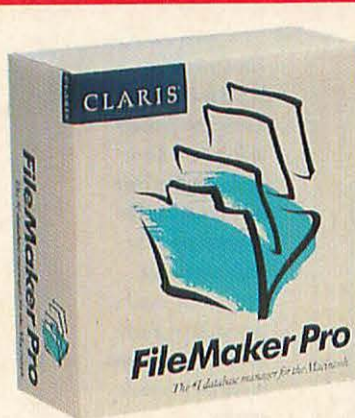
You access the many explanatory sections in Webster's Ninth via the Reference menu (and its rather daunting array of submenus and subsubmenus, each of which is displayed in a separate window). Reference-section windows are not resizable, however, and since the scroll bars in both reference and definition windows do not operate correctly, you can scroll only line by line, not page by page.

Reference Toll

All told, I found Webster's Ninth to be a significant disappointment. After all, the print edition costs less than one-tenth the price of the CD ROM version, contains the same text, tables, and graphics, is highly portable, doesn't require electricity, a Mac, or a CD ROM player, and can always be used with my word processor. Against these indisputable advantages, the CD ROM version must offer significant benefits of its own.

The recorded pronunciations clearly distinguish the CD ROM from the print version, but they are not, for me at any rate, anywhere near enough. And not only does Webster's Ninth not offer other major advances over the print edition, it doesn't even have features typically found in less expensive, more modest programs, such as resizable windows, efficient use of RAM, a well-designed Mac interface, and the ability to work within word processors and guess misspelled words. Until its many deficiencies are rectified, I'll save my money and continue to wait, either for a significantly improved Webster's Ninth or for the CD ROM version of the Oxford English Dictionary.—Robert C. Eckhardt

See Where to Buy or circle 870 on reader service card.



FileMaker Pro

(Claris Corporation)

More powerful and user friendly than FileMaker III! Choose from 100 new features including improved design capabilities, drawing tools from Claris CAD and MacDraw II, a size dialog, revised data files and support for 64 colors. Multi-user capabilities have also been enhanced through improved password protection and selected views. **\$219.** Upgrades from FileMaker II are **FREE** after April 1st.



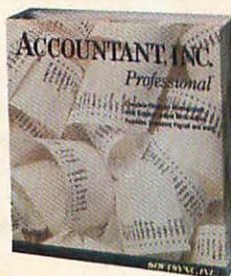
Icon-It! 2.0

(Tactic Software)

An icon is worth a thousand menus! Don't waste time fumbling through rows of menus to find program commands. Just click on the appropriate, always visible icon and set that command in motion. Its easier to use than function keys or keyboard command sequences. Use the supplied icons or design your own. **\$39.**

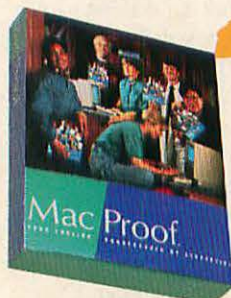
Accountant, Inc. Professional

(BLOC Development) Accountant, Inc. Professional avoids the inconveniences of modular accounting programs by allowing movement from section to section within one program, thus eliminating the need for data transfer, file merges or program switches. The package includes General Ledger, Accounts Payable, Accounts Receivable, and Payroll and Inventory. Includes features not usually found in general accounting programs, such as Job Costing and Project Management. **\$345.**



MacProof 3.2.1

(Lexpert) Because you'll never get a second chance to make a first impression! Use MacProof 3.2.1 to proofread all word processing text. Check Mechanics, Word usage, Writing style and Structure. Compatible with MacWrite II V. 1.0, MacWrite V. 4.6 & 5.0, Microsoft Word 4.0, PageMaker 3.0, w/2MB RAM, MindWrite V.1 and V.2. **\$114.**



Mac Label Pro

(Avery) Avery labels just got "Mac Easy." Now you can transform your Mac into a "Label Publisher." Features include: Preset layouts for Avery Dot Matrix Labels and Laser Printer Labels; Drawing tools and a library of clip art; ability to rotate and fill patterns; serialization for sequentially numbered labels; easy mail merge and graphic importing. **\$49.**



Vocabulearn

(Penton Overseas, Inc.)

The ideal language learning tool. Vocabulearn stores the building blocks of language in versatile, interactive hypercard stacks to make language learning both simple and exciting. Includes two 90 minute audio cassettes, over 1500 useful words & expressions and Hypercard V.1.2. Available in five languages and two skill levels...Bravissimo Vocabulearn! **French, Spanish, German, Italian \$35. ea. Japanese \$35.**



NEW! The DataDesk Switchboard

(Datadesk International)

The first user-configurable keyboard. The Switchboard's unique, modular design allows arrangement of the Alpha, Cursor and Numeric keypads into comfortable positions best suited for individual computing needs. Additional input devices (trackball, vertical function keys, digitizer tablet & macro keys) replace existing keypads or can be added to the keyboard. Modules available. **\$175.**



ACCESSORIES

Basic Needs

CPU Stand	\$16
Dust Cover - Mac IIcx RGB & Ext. Keyboard	\$12
Dust Cover - Mac SE & Ext. Keyboard	\$11
Keyboard Flip	\$6
Large Screen Monitor Stand	\$38
Laser Printer Stand	\$28
Curtis	
Command Center	\$89
EID Center Co.	
Teak Disk Holder - 50	\$14
Teak Disk Holder - 100	\$21
Teak Disk Holder - 150	\$31
Teak Double Drawer Disk Holder - 140	\$25
Ergotron	
MacTilt SE - Platinum	\$68
I/O Designs	
Macinware Mac IIcx Carrying Case	\$85
Macinware Plus Case	\$64
Macinware SE Ext. Carrying Case	\$75
The Ultimate SE Carrying Case (black)	\$79
Kensington	
Anti-Glare Filter	\$32
Apple Hi-Res RGB Anti-Glare Filter	\$63
Mac II CPU Stand	\$20
Mac II Monitor Stand	\$64
Mac II Stand w/ Extension Cables	\$64
MasterPiece Mac II	\$105
Power Tree 50 Surge Protector	\$54
Power Backer 360 UPS	\$269
System Saver Mac - Platinum	\$63
Sony	
Disks - 1.44Mb High Density	\$22
Disks - DS/DD (box of 10)	\$13
Targus, Ltd.	
Mac Plus/SE Carry Case (black)	\$54
Mac Plus/SE - Ext. Keyboard Carry Case	\$69

COMMUNICATIONS AND NETWORKS

CE Software	
QuickMail 2.2 (1-10 users)	\$315
QuickMail 2.2 (1-5 users)	\$218
CompuServe	
CompuServe Subscription Kit	\$23
CompuServe Navigator	\$49
DataViz	
MacLink Plus w/Cable	\$118
Farallon	
PhoneNET Plus SE & II	\$33
FreeSoft	
White Knight 11.0	\$84
Software Ventures	
MicroPhone II 3.0	\$215
Solutions	
FaxGate Plus	\$239
TOPS	
InBox 3.0	\$215
TOPS 3.0 Network Bundle Mac	\$186
TOPS 3.0 Network Bundle DOS	\$165
Traveling Software	
LapLink III - Connectivity Pac	\$113
LapLink III - Network Pac	\$185

DATABASES

Acius	
4th Dimension 2.0	\$464
File Force	\$249
Claris	
FileMaker Pro	\$219

Fox Software

FoxBASE+/Mac 2.0	\$290
Odesta	
Double Helix III	\$337

DRIVES

CMS

MacStack 20 Meg	\$429
MacStack 30 Meg	\$499
MacStack 45 Meg	\$589
MacStack 60 Meg	\$649
MacStack 80 Meg	\$769
MacStack 44 Meg Removable Drive	\$839

Cutting Edge

800K Floppy Disk Drive	\$149
20+ Meg Under the Mac Drives	\$309
30+ Meg Under the Mac Drives	\$379
45+ Meg Under the Mac Drives	\$435
60+ Meg Under the Mac Drives	\$469
80+ Meg Under the Mac Drives	\$529
45 Meg Removable Hard Drive	\$699

Fujitsu

800K Floppy Disk Drive	\$149
Peripheral Land, Inc.	
Cartridge for Turbo 40 Mb	\$109
Infinity Turbo 40 Meg	\$998
Infinity Turbo Dual 40 Meg	\$1,798
Turbo Floppy	\$345
Power User™	
20 Meg Drive	\$309
30 Meg Drive	\$359
45 Meg Drive	\$399
60 Meg Drive	\$459
80 Meg Drive	\$499
44 Meg Removable Drive	\$679

EDUCATION/ENTERTAINMENT

A Lasting Impression

ResumExpert (Word 3.0/4.0 ver.)	\$38
ResumExpert Cover Letters	\$38
Computer Science & Engineering	\$38
Education Edition	\$38
Finance & Banking	\$38
Arts & Leisure Edition	\$38
Health Care Edition	\$38
Manager Edition	\$38
Sales & Marketing Edition	\$38
Students Edition	\$38
Broderbund	
Shufflepuck Cafe	\$22
SimCity	\$28
The Playroom	\$29
Where in Europe is Carmen Sandiego?	\$28
Where in the USA is Carmen Sandiego?	\$28
Where in the World is Carmen Sandiego?	\$27
Bullseye	
Ferrari Grand Prix 1.6	\$31
Fokker Triplane Flight Simulator	\$23
P51 Mustang 2.04	\$30
Penton Overseas	
Vocabulearn Lvl. 1: German, French, Italian, Spanish	each \$35
Vocabulearn Lvl. 2: German, French, Italian, Spanish	each \$35
Vocabulearn Level 1 or 2 Japanese	each \$35
Silicon Beach	
Dark Castle or Beyond Dark Castle	\$31
Spectrum Holobyte	
Tetris	\$19
Welltris	\$19
XOR Corporation	
MacGolf Classic	\$51
NFL Challenge	\$53
Road Racer	\$37
TaskMaker	\$26

GRAPHICS AND DESIGN SOFTWARE

Adobe Systems, Inc.

Adobe Type Manager 2.0	\$55
Adobe Plus Pack	\$108
Adobe Type Set 1 or 2	\$58
Adobe Type Reunion	\$38
Illustrator 3.0	\$357
Photoshop	\$499
Smart I, II, III or IV	each \$83
Streamline	\$224
TypeAlign	\$57
Aldus	
Freehand 2.0	\$328
PageMaker 4.0	\$499
Persuasion 2.0	\$328
Altsys	
Art Importer	\$89

CHECK OUR PRICES!

MacSHOPPER

Fontastic Plus 2.02	\$50
Fontographer 3.05	\$248
Metamorphosis	\$149
Bright Star Technology	
InterFACE	\$249
Broderbund	
TypeStyler	\$114
The Whole Earth Catalog - CD-ROM	\$89
Claris	
MacDraw II	\$289
MacPaint	\$92
Custom Applications	
Freedom of Press	\$255
Deneba Software	
Canvas 2.1	\$188
UltraPaint	\$123
Digital Vision, Inc.	
Computer Eyes for Mac - Color	\$348
Electronic Arts	
Studio/1	\$94
Studio/8	\$294
Farallon Computing	
MacRecorder 2.0	\$158
ScreenRecorder	\$124
Insight Development	
MacPrint	\$94
Letraset	
ColorStudio	\$1,579
DesignStudio	\$598
FontStudio	\$458
ImageStudio 1.5	\$139
LetraStudio	\$273
Ready, Set, Go 4.5	\$165
MacroMind	
MacroMind Director	\$439
Metro Image Base	
Full line available	ea. \$85
OLDUVAI	
VideoPaint	\$279
Quark	
QuarkStyle	\$164
XPress 3.0	\$479
Silicon Beach	
Digital Darkroom	\$248
Personal Press	\$199
SuperPaint 2.0	\$124
Super3D 2.1	\$315
SuperCard 1.5	\$189
Spinnaker/Springboard	
PLUS	\$115
Springboard Publisher	\$107
Strata	
StrataVision 3D	\$375
Strategic Mapping, Inc.	
MapMaker 4.5	\$289
SuperMac	
PixelPaint Professional	\$388
Tactic Software	
ArtClips 1st Edition	\$50
ArtClips 2nd Edition	\$64
ArtFonts	\$54

Icon-It! 2.0	\$39
SoundClips Volume 1 or 2	each \$46
Timeworks	
Publish It! Easy	\$112
Zedcor	
DeskPaint & DeskDraw 3.0	\$114

HARDWARE/PERIPHERALS

CoStar	
LabelWriter	\$185
The Organizer (LaserWriter II Stand)	\$184
Farallon Computing	
Timbuktu 3.1	\$95
Timbuktu Remote	\$122
Kennet Technology	
Drive 2.4	\$329
Rapport	\$199
Micron	
8-Bit Video Card NB6-48	\$369
Microtek	
Microtek MSF-300GS Scanner	\$1,589
Microtek MSF-300Z Color Scanner	\$1,629
RasterOps	
RasterOps Colorboard 264	\$699
Sharp	
The Wizard	\$229
Wizard Time Management Software	\$99
Mac Linking Cable and Software	\$99
ThunderWare	
LightningScan	\$385
ThunderScan Plus	\$199

INPUT/OUTPUT DEVICES

Calcomp	
WIZ Tablet	\$159
Datadesk International	
HyperDialer	\$35
Mac-101 Keyboards	\$129
Switchboard	\$175
Kensington	
Turbo Mouse	\$108
Key Tronic	
Mac Pro Keyboard	\$118
Koala	
MacVision 3.0	\$259
Kraft	
Joystick Premium III	\$49
Kraft ADB Trackball	\$79
QuickStick 3 Button	\$39
MicroSpeed	
MacTrac ADB	\$75
MicroTouch	
The UniMouse	\$189
Mouse Systems	
Little Mouse	\$75
Trackball ADB	\$69
Practical Solutions	
Cordless Mouse	\$95

- ☒ **HUGE INVENTORY** - We carry 1800 Mac items including thousands of disks, ribbons and accessories.
- ☒ **FREE GROUND SHIPPING** - We ship in-stock items the same day.

SAVE MEGA \$\$
FREE
GROUND
SHIPPING

**EXPRESS
SERVICE**
OVERNIGHT
DELIVERY
Only \$3 Per Order

- ☒ **ALL ITEMS COVERED BY 120-DAY WARRANTY.**
- ☒ **WE CHARGE YOUR CREDIT CARD WHEN WE SHIP** - Visa and MasterCard accepted.
- ☒ **CORPORATE PURCHASE ORDERS ACCEPTED** - call us now for credit approval. COD orders, add \$7 - cash or certified check only.
- ☒ **INTERNATIONAL ORDERS WELCOME** - Outside continental USA for shipping charges and policies.
- ☒ **TOLL-FREE TECH SUPPORT HOTLINE** - (8AM to 6PM EST.)

**ORDER BY
PHONE OR MAIL**
We ship same day.
(choose free ground
or overnight \$3.00!)



MacSHOPPER



1-800-622-7006

Call toll-free 24 hours a day, 7 days a week.

(In Canada, call 1-800-243-5622)

Price and availability subject to change without notice.
Sales tax: CT and NJ residents add sales tax. We reserve the right to limit quantities.

© 1990 MacShopper Inc.
Tele-Plaza, Lakewood, NJ 08701-9836

**CORPORATE
EDUCATION
& AEROSPACE
ORDERS
WELCOME**

**All products
covered by
120-day
limited warranty.**

Ready, Set, Go! 4.5

(Letraset) Ready, Set, Go! 4.5 has added PMS color support, gray-level editing for TIFF files and comprehensive control over type, including fractional type sizes. It provides a choice of either user-designed automatic grids or free-form layout. Precise placement control makes it easy to create complex designs. The integrated word processor includes spell checking and can search and replace in type specs. (desktop publishing) **\$165.**

FREE STANDOUT!

When you purchase both Ready, Set, Go! 4.5 and ImageStudio for only **\$299!**

ImageStudio 1.5

(Letraset) Get complete creative control over cleanup and touchup tasks for computer graphics. ImageStudio improves the appearance of scanned images, video, clip art or paint and draw program work. It supports 64 shades of gray and enables adjustment of contrast and brightness to sharpen details, bring out highlights and hide unnecessary portions. Includes a wide variety of tools and special effects. **\$139.**



**OVERNIGHT DELIVERY ONLY \$3.
or FREE UPS GROUND SHIPPING**

Mail to: **MacSHOPPER**
Tele-Plaza, Box 797, Lakewood, NJ 08701-9836 **MSWJØ**

Product Name	Quantity	Cost ea.	Total

My computer is: _____
I enclose my check for \$ _____
Or charge my ☐ MasterCard or ☐ VISA

Total Merchandise _____
Sales Tax _____
Overnight Delivery \$3.00 _____
TOTAL _____

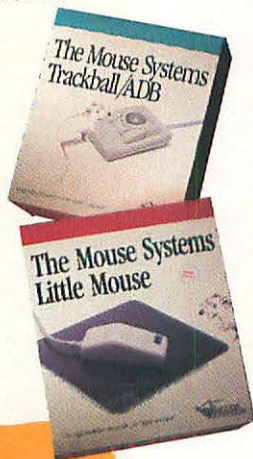
Name _____
Address _____
City _____ State _____ Zip _____ Phone () _____

Exp. date: _____



Smart One 9600 bps V.32 Modem

(Best Data) This 9600 bps modem has MNP protocols (levels 1-5) for error correction and data compression (allows throughput up to 19,200 bps). It's compatible with CCITT protocols for transmission rates from 300 to 9600 bps and with the Hayes AT commands. Includes software/cable. Comes with manufacturer's five-year warranty. **\$695.**



Trackball ADB

(Mouse Systems) Mouse functionality in a fraction of the space. Ergonomically designed for hours of comfort while providing smooth, accurate, cursor positioning. **\$69.**

Little Mouse

Because it's easier to maneuver a sports car than a bus. Little Mouse combines advanced optical technology with the latest CMOS analog/digital chip design to produce the smallest, lightest, most accurate mouse possible. **\$75.**

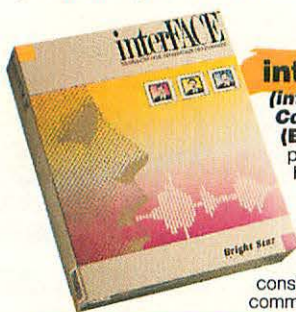
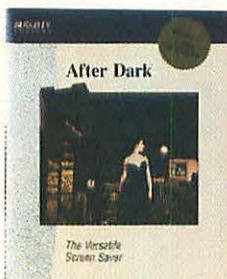


Metro ImageBase Electronic Art

(Metro ImageBase) High quality 300 dpi electronic art from one of the world's leading publishers of ready to use art. Enhance brochures, menus, reports, newsletters and presentations. One large image per file - 100 per package. Packages available: Newsletter Maker, Business Graphics, Computers & Technology, ReportMaker, Borders & Boxes and 9 others. **\$85. each**

After Dark 2.0

(Berkeley Systems) After Dark prevents screen burn-in — and does it with style! In fact any style you like. Choose from its library of over 30 different displays including lightning bolts, meteors, abstract art, crawling worms, a jump to light speed and a basic dimmer. Or use your own artwork to create custom screen savers. After Dark also offers password protection for your screen. **\$24.**



interFACE

(Interactive Facial Animation Construction Environment)

(Bright Star) This new multimedia animation product enables users to create agents for a host of software applications including corporate training, directional kiosk, education and softads. interFACE works with MacroMind Director, Wingz, Foxbase, 4th Dimension, SuperCard, HyperCard, Media Tracks, MacRecorder, and most construction environments which support external commands. **\$249.**

MacPro Keyboard

(KeyTronic) The Mac Pro keyboard feels better, lasts longer and offers more features for your money. Key Tronic's new ADB-compatible 105-key MacPro features an enlarged L-shaped Return key and Dual-legend keycaps for faster, more accurate data entry. Includes FREE copy of award winning macro package Tempo II. Backed by a three year Manufacturer warranty. **\$118.**



INSTRUCTIONAL SOFTWARE

Personal Training

Each series offers a beginning, intermediate, or advanced level. (each 90-minute tutorial contains an audio cassette, disk of lesson files, and a summary card).

Personal Training for Excel each \$36
Personal Training for FileMaker II each \$36
Personal Training for Freehand each \$36
Personal Training for HyperCard each \$36
Personal Training for Illustrator 88 each \$36

Personal Training for Macintosh

B1 The Basics (2 floppy drives) \$36
B2 The Basics (Plus or SE w/ HD) \$36
B3 The Basics (Mac II w/HD) \$36
Personal Training for Persuasion \$36
Personal Training for PageMaker each \$36
Personal Training for Word each \$36
Personal Training for Works each \$36

Voice & Video

Excel 2.2 Getting Started - VCR Tape \$35
Excel 2.2 Advanced - VCR Tape \$35
PageMaker Getting Started - VCR Tape \$35
Word 4.0 Getting Started - VCR Tape \$35
Word 4.0 Advanced - VCR Tape \$35

MEMORY/UPGRADES

1 Meg SIMMs

120ns \$75

Dove

MacSnap Toolkit \$9

Marathon 020 MSE \$579

Marathon 030 Accelerator \$449

Orchid Technology

MacPrint II \$249

MODEMS AND FAX

Abaton

InterFax 12/48 \$264

InterFax 24/96 \$418

Best Data Products

SmartOne 2400/1200 \$145

SmartOne 9600 bps v32 \$695

Travel Modem \$229

Dove

DoveFAX Desktop \$279

Orchid Technology

OrchidFax Modem \$446

Prometheus

ProModem 2400M Ext. \$199

ProModem 2400SE Internal \$209

ProModem 2400 MFax \$209

Supra Corporation

SupraModem 2400 \$129

SOFTWARE

Aapps Corp.

DigitVideo \$399

Micro TV \$265

Advanced Software

DocuComp \$89

AEC Management Systems

AEC Information Manager \$409

FastTrack Schedule 1.5 \$139

Avery

Mac Label Pro \$49

Bloc Development

Accountant Inc. Professional \$345

Caere

OmniPage 2.1 \$538

OmniSpell or OmniDraft ea. \$70

Claris

MacProject II \$365

MacWrite II \$144

Connectix

Virtual 2.0 PMMU (Mac II) \$187

Virtual 030 2.0 VM3 \$114

Dantz

Retrospect \$148

DeltaPoint, Inc.

DeltaGraph \$97

Deneba Software

Big Thesaurus \$63

Spelling Coach Pro 3.1 \$124

Exodus Software

Retriever \$59

Informix

Wingz 1.1 \$244

Insignia

Soft PC (Mac II) \$244

Intuit

Quicken 1.5 \$35

Kaetron

TopDown \$199

Layared

At Once \$284

Lexpertise

MacProof 3.2.1 \$114

Lifetree

Correct Grammar \$49

Meca

Managing Your Money \$122

Microsoft

Excel 2.2 or Word 4.0 \$245

PowerPoint 2.01 \$244

The Microsoft Office \$525

Microsoft Office - CD-ROM CALL

Works 2.0 \$177

Nolo Press

For The Record \$28

WillMaker 3.0 \$31

OLDUVAL Corporation

Read-It! OCR 2.1 \$278

Read-It! OCR Personal 2.0 \$125

Portfolio Systems

Dynodex w/ binder & paper \$57

Power Up

Address Book Plus with Binder \$83

Reference Software

Grammatik Mac 1.0 \$51

Round Lake Publishing

LetterWorks \$59

Sensible Software

Sensible Grammar \$51

Softstream

Endeavor Planner \$95

HyperHIT

HyperHIT \$125

Symantec Corporation

THINK's LightspeedC 4.0 \$165

Symmetry

KeyPlan \$243

T/Maker

WriteNow 2.2 \$117

Wolfram Research

Mathmatica Mac II 1.2 \$719

WordPerfect

WordPerfect 1.0.4 \$228

UTILITIES

1st Aid Software

Complete Undelete \$34

Deluxe 1st Aid Software Kit \$114

Sector Collector \$36

Abbott Systems, Inc.

CanOpener \$62

Aladdin Systems

Shortcut \$45

StuffIt Deluxe \$63

ALSoft

DiskExpress II 2.04 \$53

Font/DA Juggler Plus 1.16 \$42

MasterJuggler 1.5 \$63

MultiDisk 1.2 \$48

American Power Conversion

Power Chute \$67

ASD

FileGuard Extended \$139

Berkeley System Design, Inc.

Alter Dark 2.0 \$24

Bravo

SPAMM \$48

Fifth Generation System

DiskLock \$105

FastBack II \$105

Power Station \$33

Suitcase II 1.2 \$42

HJC/Microm

Virex 2.7 \$56

Kent Marsh

MacSafe 1.08C \$107

NightWatch 1.03 \$86

QuickLock 1.0 \$55

OLDUVAL

MultiClip \$69

On Technology

On Location \$74

Somak

Script Edit \$49

SharpenUp \$59

SuperMac

DiskFit \$57

SuperSpool 5.0 \$58

Symantec Corporation

Symantec Antivirus for the Mac 2.0 \$63

Symantec Utilities for Macintosh \$98

Symmetry

Acta Advantage \$64

WINDOW SHOPPING

by Lawrence Stevens

This month I review three programs that can lighten teachers' administrative duties

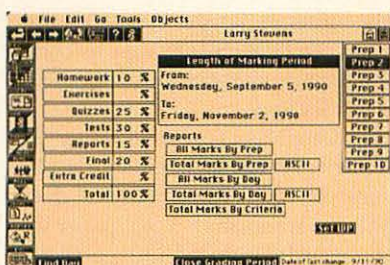
EPS Teacher's Assistant 1.1

During my ten years of teaching, the complaint I heard most frequently from colleagues, besides the antics of the ubiquitous class clown, was about the torrent of paperwork. Teachers typically do not relish entering grades, completing incident reports, keeping attendance logs, or typing formalized lesson plans.

EPS Teacher's Assistant (\$99 from Executive Productivity Systems) is a lush set of HyperCard stacks that can lighten the teacher's administrative duties. It has calendars, a memo editor, student record cards, grade and attendance sheets, and an incoming and outgoing telephone log.

When the individual modules of EPS Teacher's Assistant are compared to stand-alone applications that perform the same functions, Teacher's Assistant unfortunately falls a bit short. However, the wide range of applications and, more important, the ability to automatically distribute data through those applications, brings this program to the head of the class.

Appointment listings in EPS



Incremental Grading

The Marks stack of EPS Teacher's Assistant lets you specify the weight of each assignment in determining the final grade. The Prep buttons allow you to assign different weights for each of your classes.



RON CHAN

Teacher's Assistant can be automatically transferred among the daily, weekly, and monthly calendars; and to-do items can be carried over to future dates. If you can cajole your school secretary into providing the year's events—marking periods, school trips, and so on—in ASCII form, you can paste the data into a Dateplacer field. Then click on the Distribute the Dates button, and all the events are posted to the correct day.

The Classlist stack contains student records, including name, address, emergency telephone numbers, room number, and ethnicity. Aside from the fact that you can sort the student records in different ways, there is nothing remarkable about the Classlist stack in itself. What is remarkable is that you can transfer information from any other stack in EPS Teacher's Assistant into the Record of Contacts, a scrollable field on each student's Classlist card. So if you use the Phone stack to record a call to a student's parent

or the Marks stack to record a grade, all the information can be transferred to the student's Classlist card with a few mouse-clicks (see "Incremental Grading").

EPS gives you a wonderful smorgasbord but, like most all-in-one specials, only if you use all the modules. If you need no more than one or two modules and you're not interested in the ability to transfer data, you will be better off with a dedicated grading, calendar, or database application that will probably have more features, be more flexible, and will certainly run faster. (Like most HyperCard applications, EPS School Assistant is slow.)

On the other hand, once you've taken the time to set up this program, it runs like a dream. If your school has yet to relieve you of administrative duties, and if you have a Mac in your office, EPS Teacher's Assistant can greatly lighten your load.

Grade Machine 3.0

If your administrative duties are not broad enough for you to need EPS Teacher's Assistant or if you want a more powerful tool for computing and storing students' grades, there's Grade Machine (\$49.95 from Misty City Software).

Grade Machine makes grading and attendance record keeping relatively painless by figuring averages, entering comments in reports to students, and translating numeric averages to letter equivalents.

Most of your administrative work is done at the beginning of the semester. You specify the relative weight of each assignment, the number of assignments in each grading period, and the format of reports.

Grade Machine consists of four windows: Scores, Assignments, Students, and Summary. You spend most (continues)

Assignments (Introduction to Data Processing)					
Categories:		1 Final Exam (30%)			
2 Weekly Quizzes (20%)		3 Class Reports (10%)			
4 Lab (25%)		5 Mid-Term Exam (15%)			
Friday Quiz (9/14)					
#	Assignment	Pts Poss	Weight	Adjusted	Category
1	Friday Quiz (9/14)	8	12.500	100	2
2	Friday Quiz (9/21)	12	6.333	100	2
3	Friday Quiz (9/28)	11	9.091	100	2
4	Friday Quiz (10/5)	13	7.692	100	2
5	Lab Report #1	55	1.818	100	4
6	Friday Quiz (10/12)	11	9.091	100	2
7	Friday Quiz (10/19)	19	5.263	100	2
8	Friday Quiz (10/26)	15	6.667	100	2
9	Class Report #1	4	25.000	100	3
10	Friday Quiz (11/2)	11	9.091	100	2
11	Mid-Term Exams	100	1.000	100	5

Tracking Assignments

In Grade Machine all your assignments are listed. The Points Possible column contains the highest number of correct answers. You can type the maximum adjusted score (often 100 percent) into the Adjusted column. The Weight column contains the figure—either entered by you or entered automatically by the program—used to figure the Adjusted score.

of your beginning planning time in the Assignments window (see "Tracking Assignments"). For each assignment or test you specify the maximum raw score (total number of correct answers) and how the score should be translated into a percentage score. You enter the students' raw scores in the Scores window. The program then calculates the percentage score and the student's class average.

You can also designate up to five categories of assignments, such as lab work, homework, or quiz, and indicate the weight each assignment has in determining the final grade.

The Students window is your roster. You identify each student both by name and confidential ID name or number. The ID allows you to post class reports on a bulletin board and maintain students' anonymity.

The Summary window lists all students, their total averages, averages by category of assignment, and students' letter grades.

My only complaint is that although Grade Machine is set up in rows and columns, it lacks rudimentary spreadsheet editing functions such as fill down or copy and paste. And its limited use of Undo can be maddening.

Still, Grade Machine is much better at maintaining grades than EPS Teacher's Assistant. Teacher's Assistant doesn't translate raw scores and will only tally up averages from seven assignments or tests. Grade Machine tracks an unlimited number of scores.

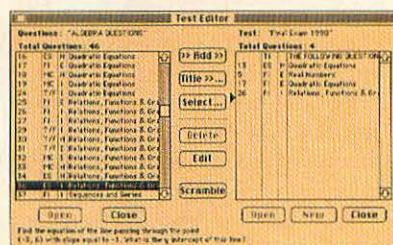
Schools vary in the amount of

responsibilities teachers must carry. If you attend committee meetings, make frequent calls to parents, constantly run to the office to look up student records, and have trouble organizing your lesson plans, you should buy EPS Teacher's Assistant. If, on the other hand, your heaviest responsibility is grading tests and tallying averages, Grade Machine is your best bet.

MakeTest 1.1.1

MakeTest (\$149 from Mountain Lake Software) won't eliminate the need to type test questions, although it does help with formatting multiple-choice and true-or-false questions. Its main advantage is that once your questions are typed, you can easily find, select, and place them into any test.

You enter all the test questions in the Question Editor, which contains two fields, a Question Panel and an Answer Panel. You can either type or paste in text and graphics into the Question Panel. If a question is multiple choice, the Answer Panel displays as many alphabetically labeled check boxes as you specify. You type the answer next to each box, signifying the correct response by clicking on the appropriate box. The Answer Panel for true-or-false questions displays two check boxes labeled True and False; you indicate the answer by selecting one. The Answer Panel for other types of questions allows you to type the correct answer in paragraph form.



Creating a Test

MakeTest's Test Editor lets you craft a test by clicking on questions. The Question Panel, at left, lists all questions in the Question file. The Add button adds the selected question to the test, which appears in the Test Panel at right. The Title button takes you to a field where you can enter and edit test headings or instructions. The Scramble button rearranges the test questions in random order. The Select button causes the program to choose random questions based on your parameters.

Using pop-up menus, you specify a topic (you can define as many topics as you want), type (fill-in, essay, true-or-false, or multiple choice), and difficulty (easy, intermediate, or hard) for each question.

Your questions are stored in a Question file. To make a test, you simply select questions from this file using the Test editor screen (see "Creating a Test"). The left side of the Test Editor screen contains the first few words of each of your test questions in a scrollable list. When you select a question by clicking on it, most or all of the text appears at the bottom of the screen.

To include a question in your test, select Add. The question then appears on the right side of the Test Editor screen. Alternatively, MakeTest can randomly select any number of questions for you, by type, difficulty and topic.

The biggest shortcoming of MakeTest is that you cannot see how the printed test will look. You only see a tiny scrollable panel that lists the questions you've selected along with the first few words of any headings or instructions. So if you've formatted the test using various fonts and alignments on different sections, you'll have to print out a hard copy to see how the test looks. It's a shame that such a good program lacks a WYSIWYG interface.

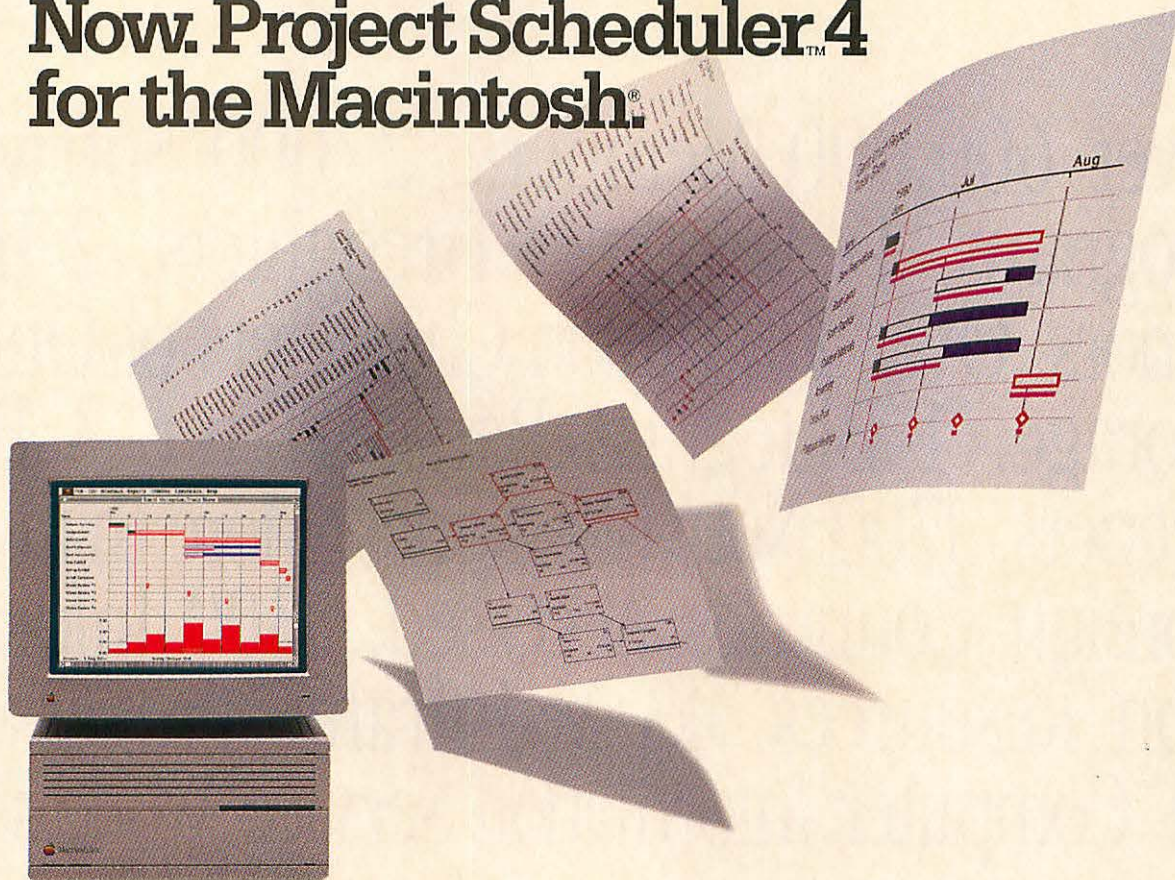
Still, MakeTest provides the best way I have seen to store and categorize test questions. Of course, if you already have a lot of questions in a word processor file, it can take a long time to copy and paste them into MakeTest. An importing capability would be a nice addition. But after the input is finished, creating new tests can be almost as easy as choosing team members in a school-yard softball game.

With MakeTest and either EPS Teacher's Assistant or Grade Machine, most of your nonpedagogical duties will be automated. Your paperwork time will be reduced, and you'll have more energy to devote to being creative and more patience in dealing with the ubiquitous class clown.

See Where to Buy or circle 740 (EPS Teacher's Assistant), 747 (Grade Machine), 811 (MakeTest) on reader service card.

Do the right thing at the right time.

Now. Project Scheduler 4TM for the Macintosh.[®]



Project management software shouldn't just hand you information. It should speak your language.

That's why we designed Project Scheduler 4—the first professional project management system for the Macintosh that works the way you work. With the familiar Mac interface you can understand from the start. Powerful project control capabilities that streamline everything from initial planning and scheduling to resource

allocation, tracking, and analysis. And highly flexible reporting options that help you supply everyone involved in your projects the information they require to get the job done.

Now you can easily manage all your resources across multiple projects simultaneously. Use powerful interactive and automatic resource leveling to find the answers to important "what if" questions. Automatically account for resource-cost inflation. And create striking presentations and reports that clearly illustrate

problems—and opportunities—at a glance.

In short, Project Scheduler 4 gives you all the tools you need to do the right thing at the right time. Every time. For more information and a brochure, call or write:

415/570-7700

393 Vintage Park Drive
Suite 140
Foster City, CA 94404

Macintosh is a registered
trademark of Apple
Computer, Inc.

Scitor
Corporation

Strength in Numbers.

Over 600,000 Members. 27,000 Software Programs. 14 Volunteer Firefighters. 2 Irish Tenors. Over 100 Billion Characters of Online Storage. 1 Bluegrass Banjo Player. 3 Beekeepers. 1700 Network Nodes. More than 100 Foreign Countries Accessed. 1300 Information Resources. 43 Mainframe Processors. #1 Computer Information Service Worldwide.

When you join CompuServe, you're joining the largest online computer information service in the world. We have more members, better equipment, greater capabilities, and more knowledgeable experts than anybody else.

And that means we can provide things no one else can. Including more investment information, hardware and

software support forums, shopping services, and research resources; hundreds of different information, communications, and entertainment services; and the most highly qualified intelligent, curious, and interesting staff people anywhere. (We figure we can not only outperform the competition, we can outsize them, too.)

So contact CompuServe. Because when you put it all together, our numbers really add up. To number one.

To join CompuServe, see your computer dealer. To order direct or for more information, call today.

CompuServe®
800 848-8199

Visit us at MACWORLD, August 9-11, Booth 1922 at Bayside Expo.

Circle 319 on reader service card

You Take Care Of Business.



Introducing the accounting software that does just what you need it to do.

Everything.

ACCPAC® accounting software was designed specifically for businesses like yours—so you can spend less time balancing your books and more time building your business.

No matter what you need to do—send an invoice, pay a bill, write a paycheck—ACCPAC provides a quick and simple way to do it. And it's so easy to learn you'll have it up and running in minutes.

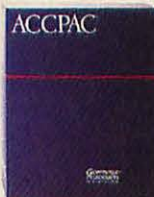
At the same time, the ACCPAC family offers more advanced and comprehensive accounting packages that your company can easily upgrade to as your business grows.

That's why today, ACCPAC is the best-selling accounting software in the U.S. and Canada. All kinds of businesses in every type of industry trust their books to ACCPAC.

So should you.

Ask for ACCPAC BEDFORD® at your local software dealer or call 1-800-531-5236.

And then take care of business. ACCPAC will take care of your books.



CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.

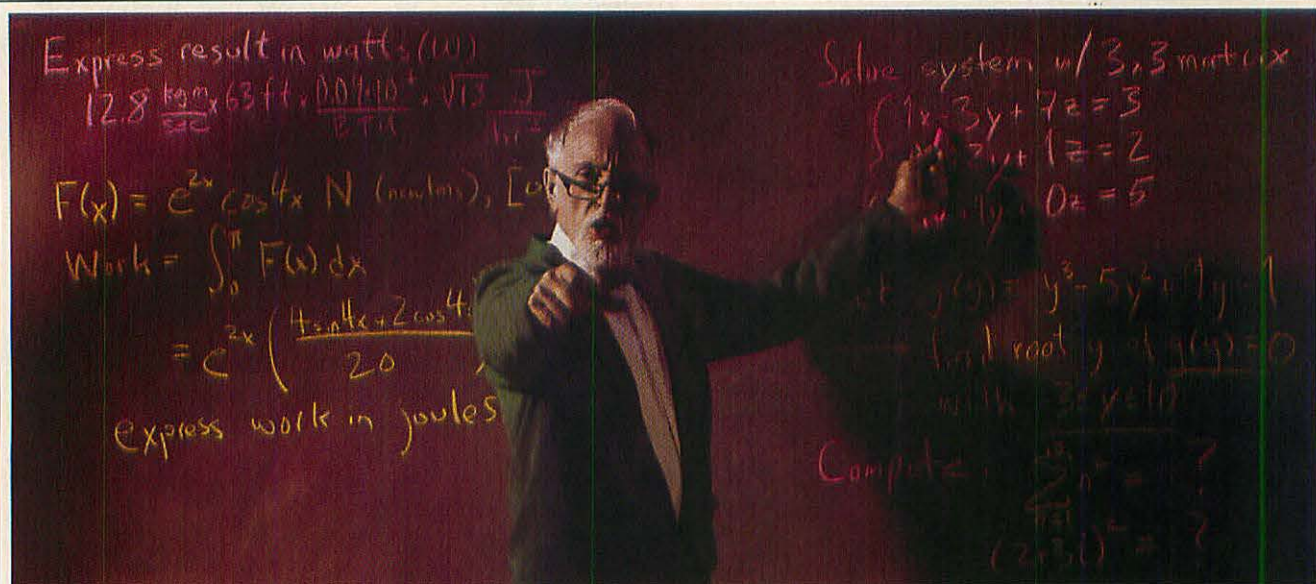


We'll Take Care Of Your Books.

ACCPAC BEDFORD SIMPLY ACCOUNTING™ runs on the Macintosh.
© 1990 Computer Associates International, Inc., 711 Stewart Avenue, Garden City, NY 11530-4787

Circle 25 on reader service card

In college, you would have killed for MathCAD. So why aren't you calculating with it now?



100,000 engineers and scientists already let MathCAD do their calculations for them.

Now that college is far behind you, perhaps it's time you graduated from spreadsheets, calculators and programming.

Because in today's working world of engineering and science, there's no time for anything less than MathCAD. The software that lets you perform engineering and scientific calculations in a way that's faster, more natural, and less error-prone than any calculator, spreadsheet, or program you could

write yourself.

Thanks to MathCAD's live document interface, you can enter equations anywhere on the screen, add text to support your work, and graph the results.

It also comes complete with over 120 commonly used functions built right in. Perfect for creating complex equations and formulas, as well as exponentials, differentials, cubic splines, FFTs and matrices.

MathCAD also gives you three-dimensional plotting and vivid graphing capabilities. Even entering operators and Greek letters into equations is a snap.

Done calculating? MathCAD prints *all* your analyses in presentation-quality documents, even on PostScript® compatible printers.

All of which has made MathCAD far and away the best-selling math software in the world. In fact, it's used by over 100,000 engineers and scientists — just like you.

There's MathCAD for the Macintosh.® MathCAD for the

PC. And a Unix® version that utilizes the speed and unlimited memory of your Unix workstation.

We also have Applications Packs for Advanced Math, Statistics, Mechanical, Chemical, and Electrical Engineering. Each is a collection of adaptable mathematical models, designed to let you start solving your real world problems right away.

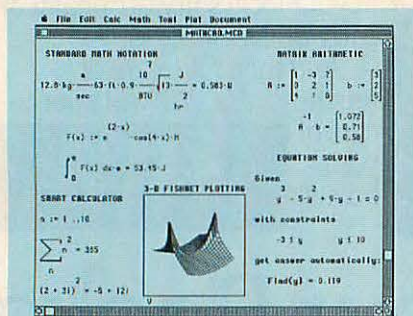
For a free MathCAD demo disk, or upgrade information, dial 1-800-MATHCAD (in MA, 617-577-1017). Or see your software dealer.

Available for Macintosh computers, IBM® compatibles, and Unix workstations. TM and ® signify manufacturer's trademark or registered trademark, respectively.

1-800-MATHCAD

MathCAD®

MathSoft, Inc., 201 Broadway, Cambridge, MA 02139



MathCAD takes full advantage of the Macintosh® interface, with features that make it simple to enter operators and Greek letters into equations.

NEW PRODUCTS

Edited by Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

96E4 Mac-Pac

Modem package that consists of the Anchor 96E4 9600-bps modem, Mac interconnecting cable, and Quick Link II communications software. Compatible with all modems that use the CCITT V.32 full-duplex protocol. \$995. Anchor Automation, 818/998-6100.



400 DPI Grayscale Scanner

400 DPI Grayscale Scanner

Mac-compatible 400-dpi gray-scale hand-held scanner with a scan width of 4 1/10 inches and can scan a page 14 inches long. Scanner has built-in window for visual scan alignment and has multiple rollers for one-pass scanning accuracy at a scan speed of 1 inch per second. 1MB min. memory. With SCSI controller \$599; with NuBus controller

\$499. Asuka Technologies, 714/757-1212.

Access 650 WORM Subsystem

Laser Magnetic Storage WORM drive that comes complete with driver software, cables, and documentation. Uses a 654MB double-sided removable 5 1/4-inch cartridge and a SCSI interface. Has 75-millisecond average access time, and a 600K/second-user throughput. \$2995. Optical Access International, 617/935-2679.



Access 650 WORM Subsystem

CAMM-1 Desktop Sign Maker

Peripheral designed for the vinyl sign-making industry. Supports all Mac models and peripherals: supports graphics and text software such as Adobe Illustrator, Adobe Streamline, Aldus FreeHand, Letraset's LetraStudio, and Brøderbund's TypeStyle. Also supports EPSI to convert PostScript format to HPGL-format for output. Enables sign to be displayed on the monitor before printing. \$4495. Roland Digital Group, 714/975-0560.

Color Presentation System

Bundled system that includes a Sharp JX-730 color

ink-jet printer, automatic cut-sheet feeder, Chooser-level driver, and JFT Parallel interface. \$2395. Sharp Electronics, 201/529-9500, 800/223-2121.

ColorSpace Plus/SE

Multimedia system for the Mac Plus and SE. Proprietary keying technology overlays black-and-white Mac-created text or graphics in color on full-motion, full-color, live or recorded composite NTSC or S-Video output. Also supports a variety of output modes user-selectable from front panel switches or through software. \$1895; adapter cable \$100. Mass Microsystems, 408/522-1200.



DSP and Data Acquisition Card

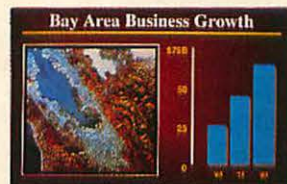
DSP and Data Acquisition Card for the SE/30

Self-contained data-acquisition board for the SE/30. Includes a floating-point DSP chip. Runs at 32 MFLOPS and can do a 1024-point FFT (fast Fourier transform) in 2 milliseconds. \$2695. Spectral Innovations, 408/727-1314.

FilmPrinter Turbo

Slidemaker that can produce 36 slides from Mac

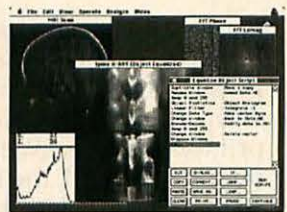
screen images in about one hour. Prints each pixel with 36-bit color resolution and supports the Mac and IBM PC-compatible platforms when used with the appropriate MirusImage accessory software package. \$7995. Mirus, 408/944-9770.



FilmPrinter Turbo slide

ImageScript and 4IIP Memory

Upgrade boards that enable the LaserJet IIP to do PostScript printing. ImageScript requires 1.5MB of RAM to operate. 4IIP Memory additions include a 1MB RAM board. 4IIP Memory \$349; ImageScript \$595. PCPI, 213/670-5606.



IPLab Image Grabber System output

IPLab Image Grabber System

Image processing system that includes a Neotech Image Grabber NuBus board bundled with IPLab image processing software, and technical support service. Images digitized with the system can be ex-

(continues)



changed with minicomputers and mainframes without translation. Supports standard NTSC and European PAL video standards. 2MB min. memory. \$2099. Signal-Analytics, 703/281-3277.

KX-P 4455 Laser Partner

11-pages-per-minute Adobe PostScript laser printer. Has dual paper bins that hold 250 sheets each. Includes 39 fonts, HP Series II emulation. Comes with 2MB RAM, expandable to 4MB. \$3495. Panasonic Communications and Systems Company, 800/742-8086.

LView Multi-Mode

19-inch monochrome display system that offers a choice of six different resolutions: 120, 92, 72, 60, 46, and 36 dpi. Has refresh rates of up to 92Hz. Utilities software comes with pop-up menus, screen cap-

ture, enlarged menu bar, multiple cursor sizes, and a screen saver. \$1999. Sigma Designs, 415/770-0100.



LView Multi-Mode

MacPacq Model MP100

Laboratory data-acquisition and control system for the Mac that is designed to replace strip-chart recorders, tape-based data loggers, and oscilloscopes. Can simultaneously record from 16 analog and 16 digital channels. Bundled with software driver and HyperCard interface. \$2295. Biopac Systems, 805/967-6615.



MacPacq Model MP100

Mobius One Page Display

Full-page-size display for use with the SE that contains an accelerator board that doubles the speed of a standard SE. Supports dual screen use so the SE screen can be used to hold desk accessories, open multiple documents, or display tool palettes while you work on the One Page Display. \$795. Mobius Technologies, 415/654-0556.

The MousePen/ADB Version

Mouse-like input device that is shaped like a pen. Designed for graphics-intensive applications such as freehand drawing, CAD, and desktop publishing.

Adjusts automatically from 100 to 1000 cpi (counts per inch). Operates at a variety of angles. \$99. International Machine Control Systems, 805/239-8976.



The MousePen/ADB Version

NuCarrier System

Data-acquisition system for the Mac II based on the modular I/O concept. Plugs in to a NuBus slot in the Mac. Standard on-board capabilities include 16 single-ended or 8 differential analog-input channels with 12-bit resolution at sampling rates up to 70kHz; 16 digital I/O channels; two in-

HP offers you the best things next

From input to output, Hewlett-Packard leads the way. With a full line of Mac-compatible printer and scanner choices.

For photographic-quality scanning, there's the HP ScanJet Plus scanner. Combine that with one of HP's high-quality printers. The DeskWriter, the new LaserJet III, the LaserJet IIP, or the LaserJet IID. HP even has color printers. The PaintJet and the PaintWriter XL.

Plus, HP stands behind all their products with exceptional service and support. And a one year warranty. It doesn't get much better than that.

There is a better way.



**HEWLETT
PACKARD**

Circle 288 on reader service card.



dependent counters/timers; and a burst generator. \$995. Intelligent Instrumentation, 602/624-2434.



NuCarrier System

Pacific MacPage

PostScript emulation cartridge that can be inserted into the HP LaserJet printer to give it Macintosh PostScript compatibility. For HP LaserJet II \$795; for HP LaserJet IIP, IID, III \$599. Pacific Data Products, 619/552-0880.

QuickImage 24

NuBus frame-grabber board designed to capture an NTSC (or PAL) video frame in 1/30 second for use in

desktop publishing, technical documentation, creating published material from videotapes, or for creating special artwork effects. Accepts input from any composite or S-Video source. \$995. Mass Microsystems, 408/522-1200.

REO-130 Optical Drive

3 1/2-inch erasable optical drive with a 28-millisecond seek time. Holds 128MB of data and has a shelf life of 10 years. \$2995; cartridges \$129. Pinnacle Micro, 714/727-3300, 800/553-7070.

SCSI Bus Multiplexers

Multiplexer products for use with fault-tolerant and high-reliability computer configurations to switch between backup peripheral devices. Can also be used to connect up to 21 peripherals to a single SCSI initiator in applications such as

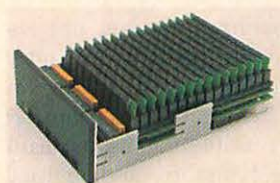


REO-130 Optical Drive

production testing, burn-in, process control, and robotics. SM-90/12 \$2480; SM-90/13 or SM-90/22 \$2840. Ancot, 415/363-0667.

SCSI Dart

RAM disk that contains an embedded SCSI controller and emulates a hard disk drive. Contains 32 slots for



SCSI Dart

memory expansion. Comes bundled with 2MB of RAM and a UPS battery backup system. Average seek time is under 0.1 millisecond using standard hard disk tests. Unit has no moving parts. \$3395. Newer Technology, 316/685-4904.

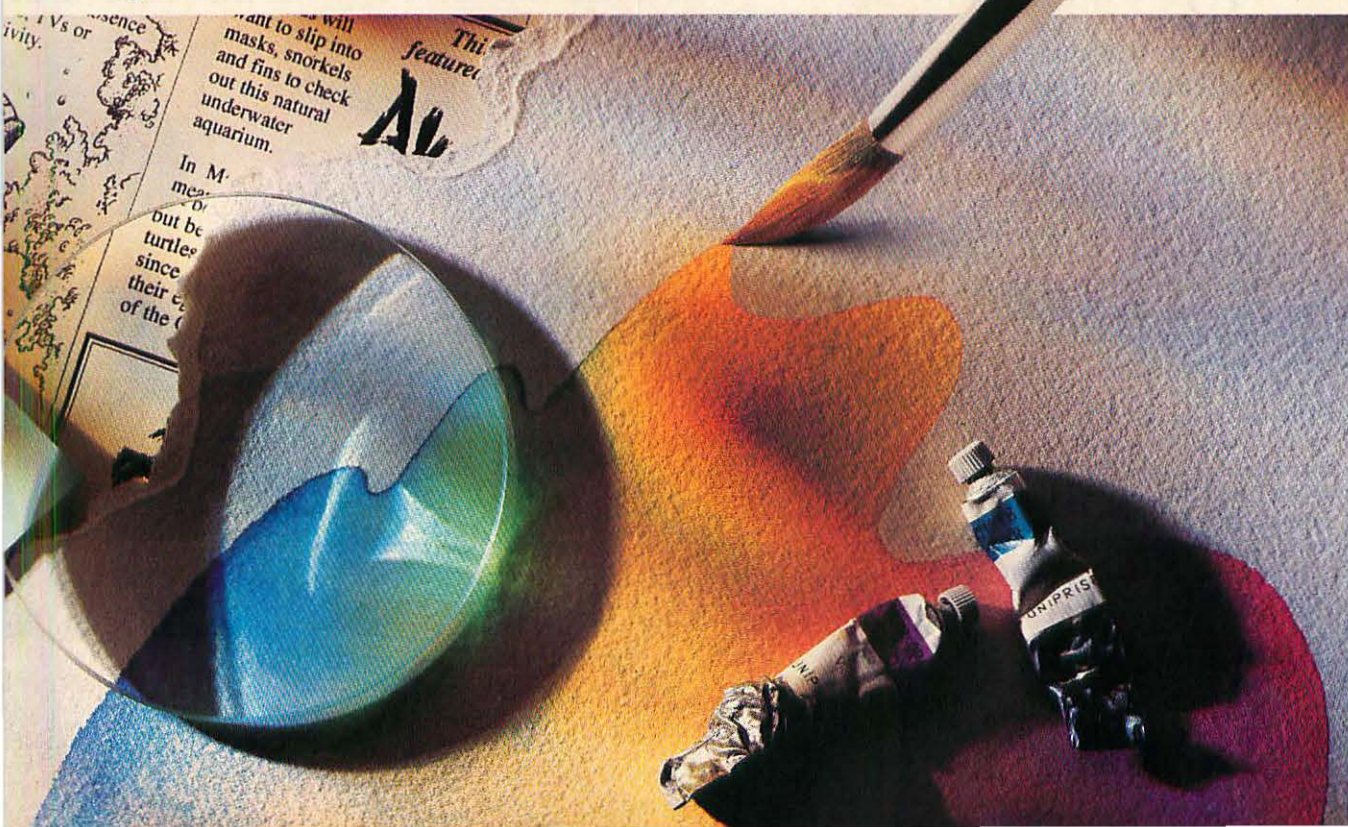
UltraDrive 430S and 430Si

430MB external and internal drives that use the Seagate Wren VI half-height drive mechanisms. Capable of 16-millisecond average access time, GCC UltraWare disk software, GCC Partitions, QuickSpool II, and QuickEnvelope. External \$2699; internal \$2549. GCC Technologies, 800/422-7777.

VGA Monitor

14-inch VGA-resolution monitor with 31.5 and 35.5kHz horizontal scan (continues)

to your Macintosh.





frequencies and a 45MHz video bandwidth. Compatible with the Mac and IBM PC compatibles. \$599. Power II Technologies, 213/697-3969.

SOFTWARE

3D Modeler

Three-dimensional modeling program that enables free-form modeling with handles for editing curves and surfaces, creating smooth surfaces across various cross sections, extruding and lathing at any angle, and autosurfacing with options for handling holes. 1MB min. memory. \$595. Visual Information Development, 818/918-8834.

3D Producer

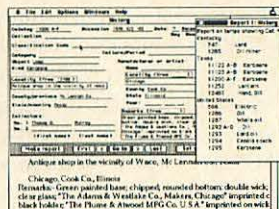
Animation software that is compatible with modeling programs such as Super3D, AutoCAD, MacBravo, and

**3D Producer**

Dimensions 3D Modeler. Animation spreadsheet allows frame-by-frame control of objects, light sources, and cameras. 1MB min. memory. \$695. Visual Information Development, 818/918-8834.

Accession

Software for managing museum collections. Organizes catalog entries, accession and donor information, and additional non-archival data. Versions are available for history, natural history, archaeology, geology, and other disci-

**Accession**

plines. 1MB min. memory. \$795; contact vendor for site license. Oak Tree Software, 407/339-5855.

CGM/Pro

Software system developed to help corporate users manage cross-functional management programs for employees. Lets the user draw process-flow diagrams that include tasks, meetings, reports, decisions, and milestones. 1MB min. memory. \$2495. TSG, 617/497-0423.

ClickArt Animals & Nature

Collection of more than 150

PostScript images of animals and nature: insects, dinosaurs, exotic animals, farm animals, the earth and solar system, weather and seasons, trees and plants, flowers and grains, and borders and dingbats. 1MB min. memory. \$129.95. T/Maker, 415/962-0195.

Color MacCheese

32-bit paint application includes antialiasing, a Translucent Paint feature that lets you set the level of paint transparency, an interactive help function, linear and radial gradient fills, and customizable color patterns. Lets you use 32-bit color with an 8-bit video board. 1MB min. memory. \$99. Delta Tao, 408/730-9336.

The Computer Glossary

Computer glossary that defines over 4000 terms for novice computer users.

Pigments for your imagination.

HP color printers let you draw splashy color from your Macintosh.

Entertain your thoughts with HP's PaintJet and PaintWriter XL color printers. Both are fully Mac-compatible and let you use all Quickdraw-based software applications. That means high-quality Macintosh II output in 16.7 million colors.

Print on paper or transparencies with 13 scalable outline fonts. And for shared use, the PaintWriter XL offers AppleTalk, faster speed, and auto sheet feed. For sample output and the name of your authorized HP dealer, call 1-800-752-0900, Ext. 1167.

There is a better way.



**HEWLETT
PACKARD**

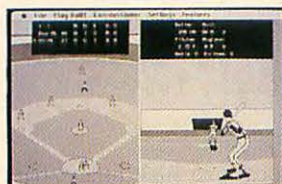
Circle 301 on reader service card



Covers personal computing, computer graphics, LANS, and DTP. 1MB min. memory. \$59.95. The Computer Language Company, 215/297-5999.

Earl Weaver Baseball

Baseball-simulation game with two levels of play, Arcade and Strategic. Arcade mode uses graphics and digitized sound to evoke the sense of an actual ball game. Strategic level enables the player to act as team manager, keeping tabs on injuries, setting pitching rotations, and monitoring the accumulated stats using a built-in compiler. Coau-



Earl Weaver Baseball

thored by Earl Weaver, former manager of the Baltimore Orioles. 1MB min. memory. \$49.95. Electronic Arts, 415/571-7171.

Flostat

Entry-level statistical-analysis mapping and graphics software, capable of linking data to maps or exporting tables and graphs to page-layout software. 1MB min. memory. \$99. PSRC Software, 419/372-8648.

Fontina

Application that displays a multicolumn menu for fonts installed in the System, and groups related typefaces where possible. 512KE min. memory. \$69.95; 10-pack \$295. Eastgate Systems, 617/924-9044, 800/562-1638.

Ghoster

Application to produce



Ghoster

electronic screen tints in 10 percent gradients for desktop-published documents. Output prints on any PostScript printer. Tint screens are printed in position for black and color-separated images. 1MB min. memory. \$29. Sparkle, 619/455-7048.

If:8 Forms Designer

Forms-design package. Forms structure consists of cells that automatically stretch or shrink to accommodate text input. 1MB

min. memory. \$279. SoftView, 805/385-5000.

Informed Mini-Manager

Application for filling in forms created with Shana Corporation's Informed Designer. User creates forms with Informed Designer and can fill them in with the information database provided by Informed Mini-Manager. Database supports searching from any field and has multiple printing options. 1MB min. memory. \$99. Shana Corporation, 403/453-3330.

Jack Nicklaus' Greatest 18 Holes of Major Championship Golf

Golf-simulation game that features 18 holes from courses where the four major championships have been contested. User plays against image of Jack Nicklaus. (continues)



*The PaintJet with
Macintosh interface.*
\$1,520*



*The PaintWriter XL
designed for shared use.*
\$2995*



laus that possesses skills patterned after his own game. User chooses Skins scoring or Stroke play. Has beginner and expert level. 1MB min. memory. \$59.95. Accolade, 408/985-1700.

Jack Nicklaus Presents the Greatest Championship Courses of 1989

Add-on course disk to Jack Nicklaus' Greatest 18 Holes of Major Championship Golf program. Game simulates the greatest golf courses played in 1989 including those used for the U.S. Open, the PGA, and



Jack Nicklaus' Greatest 18 Holes of Major Championship Golf

the British Open. 1MB min. memory. \$21.95. Accolade, 408/985-1700.

Jack Nicklaus Presents the International Course Disk

Add-on to Jack Nicklaus' Greatest 18 Holes of Major Championship Golf. Simulates three internationally known golf courses: one in Japan, one in Australia, and one in England. 1MB min. memory. \$21.95. Accolade, 408/985-1700.

Learn to Speak English

HyperCard-based English-language tutorial. Includes 36 HyperCard lessons, interactive drills for English grammar, a grammar reference, and cultural notes about life in America. Four native speakers of English read dialogues either on CD or audiotape. Available in CD ROM, audio CD, and cassette versions. 1MB min.

memory. CD ROM \$249.95; audio CD with 15 discs \$249.95; cassette with 15 discs \$149.95. The HyperGlot Software Company, 615/558-8270.

List Learner

Application used to build lists of information on any subject and test recall of that information using flashcard or multiple-choice quizzing. 1MB min. memory. \$59.95. Selective Memory, 408/371-5595.

Mac Headlines

Volumes of EPS or PICT format headlines. Can be used with word processor or desktop publishing program. Each volume has a selection of titles for holidays, business use, flyers, schools. 1MB min. memory. EPS \$19.95 per volume; PICT \$14.95. Asgard Software, 703/255-3085.

Mac Wire Frame

3-D wire-frame editor. Objects can be moved, scaled, rotated, and viewed from various angles. Includes a developer's toolbox with complete Pascal source code; data types; procedures and functions used to create the editor program; and the source code used to create the editor program itself. 2MB min. memory. \$499.95. Amplified Intelligence, 916/737-1550.

MacMatrix

Software driver for Toshiba's 24-pin letter-quality printers. Kit includes disk, manual, and cable to interface Mac Plus or later model with a Toshiba SL printer. 1MB min. memory. \$49. Toshiba, 714/583-3000.

MailMaker

Local-area mail utility that lets electronic mail users

With the HP DeskWriter, you can

The Paradise Times
VOL. III SPRING, 1990 WANDERING TOURS LTD.

For the traveler craving the tropical essence of the Yucatan as well as a dash of the good life, Akumal is the place. It's not the luxury class of Cancun, but it beats the pants off most other small resorts along the coast.

Akumal prides herself on the conspicuous absence of telephones, TVs or bustling activity.

Folks, this town is laid back. It offers a good selection of hotels, dining and activities to soothe frazzled city nerves.

A large barrier reef runs parallel to the Quintana Roo coast, protecting the lagoon from the open sea. Basically it creates a gigantic underwater playground, chock-full of Caribbean underwater goodies which attract divers from all over the world.

For the archaeology buffs out there, Akumal is 15 km from Tulum. For the rest of us that means it's close to one of the few walled Mayan ruins. Xelha is another 5 km, and even the amateurs among us will want to slip into masks, snorkels and fins to check out this natural underwater aquarium.

In Mayan lingo, Akumal means "Place of the Turtle" not because it's so laid back, but because giant green turtles have come ashore since the dinosaur days to lay their eggs in the warm sands of the Caribbean.

This month's featured destination:
Akumal

Surrounding Akumal are lush jungles and thick coconut groves. Bright red bromeliads bloom high in the trees during early spring sustaining themselves on rain, dew and humidity. While checking out bromeliads, you will probably see it's cousin, the orchid.

Along the porous sand of the Akumal beaches, you'll find lots of really neat stuff: conch shells, lacy red seaweed, coconuts sprouted after soaking in the sea for months, and crabs of all sizes and colors.

Relax amidst the long stretches of wind bent coconut trees which set off the blazing white sands of Akumal's sweeping beaches.



MacMatrix

send formatted faxes from their desks. Lets the user transmit files created in most Mac applications via data or fax modem. Available in Microsoft Mail and QuickMail versions. 1MB min. memory. Single user \$40; five-pack \$195; ten-pack \$345; twenty-pack \$595; fifty-pack \$1250. Solutions International, 802/658-5506.

Music Mouse

Application for creating music on the Mac. Supports MIDI and the Mac's internal sounds. 1MB min. memory. \$79. Dr. T's Music Software, 617/244-6954.

NanoDisk

Memory-enhancement software that comes bundled with 16MB or 32MB of Technology Works SIMM modules. System enables the Mac to access all available internal memory, expanding accessible memory to 32MB. 1MB min. memory. \$1995. The Technology Works, 512/794-8533.

NeuralWorks Explorer

Software tutorial that gives the novice user a method of learning neural-network theory as well as an environment in which to build practical applications. 2MB min. memory. \$199. NeuralWare, 412/787-8222.

NeuralWorks Professional II

Neural-network development environment for advanced technology groups and application developers within the neural-network

community. Designed for solving problems such as credit card fraud and for insurance underwriting and bond or stock portfolio management. InstaNet feature enables users to access another network from a user-configurable list. 2MB min. memory. \$1495. NeuralWare, 412/787-8222.

On Location

Desk accessory reduces the time it takes to find and view files. Indexes the name and text of files on any volume, and combines digital-signature compression technology, Claris/DataViz file translators for displaying text stores in most word processing formats, and automatic background indexing. \$129.95. On Technology, 617/224-2545.

PlayMaker

Football-simulation soft-

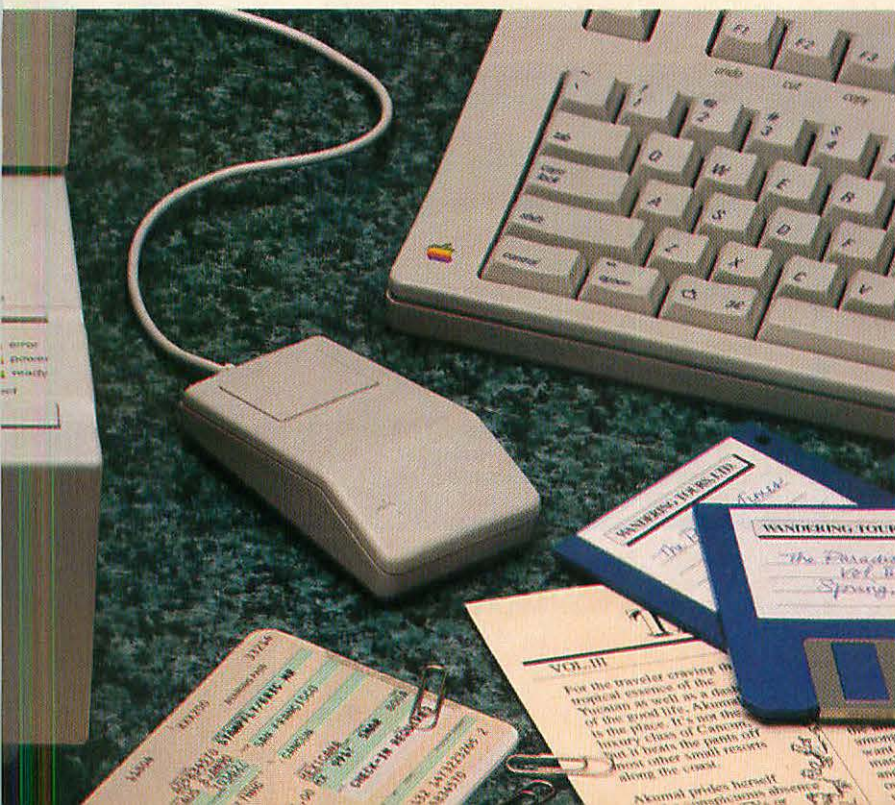
ware that re-creates the actions of an 11-man football squad with animated graphics. Allows you to assume the role of head coach and design custom plays and strategies for your team. Can be played individually or over a network. 512K min. memory. \$49.95. Brøderbund, 415/492-3200.

QuickGIF Plus

GIF decoder that runs three to four times faster than existing utilities and is able to play GIF animated images in real time. Program also has the ability to display PICT images (including 32-bit PICT files), MacPaint, and ReadMac (PC MacPaint) files. Enables the user to create a "slide show" of graphics and sound files within a folder. 1MB min. memory. \$30. AmarilSoft, 415/455-0424.

(continues)

have it all. (But keep it to yourself.)



The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a \$995* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

The DeskWriter is also designed for easy use with your Macintosh, and has both serial and Apple Talk interfaces. It even includes scalable and outline fonts. Combine that with the DeskWriter's whisper-quiet operation, and keeping it to yourself will be that much easier. So call 1-800-752-0900, Ext. 1004 for your authorized HP dealer.

There is a better way.



**HEWLETT
PACKARD**

Circle 343 on reader service card

**Recognize for the Macintosh**

OCR application compatible with Dest's PC Scan series of scanners, HP's ScanJet and ScanJet Plus, and the Apple Scanner. Combines omnifont recognition, full text-formatting control, and recognition across a wide range of type fonts. Implements Claris's document interchange standard XTND technology. 1MB min. memory. \$695. Dest, 408/436-2700.

Reflection 2 Plus

Mac-to-VAX terminal-emulation software that emulates VAX model VT320. Works with MultiFinder; comes with command language so users automate functions such as dialing in to hosts and transferring files between machines. 1MB min. memory. \$249. Walker, Richer & Quinn, 206/324-0350.

ScrapMaster

Application designed for the scrap-metal recycling industry. Provides a database to manage all aspects of a recycling business. Includes accounts receivable and accounts payable, general ledger, payroll, daily sell and buy reports. Database may be customized to suit a particular client's needs. 1MB min. memory. \$4000. Consolidated Resources, 301/907-6616, 301/796-9044, 800/262-6614.

Shapes

Add-on module for Letraset's ColorStudio that adds outline drawing and antialiased rendering tools to the paintbox capabilities of ColorStudio. Enables users to render any object or font as antialiased. 5MB min. memory. \$295. Letraset, 201/845-6100, 800/343-8973.

Sound Manager Package

Sound-management application that contains Sound Mover, which allows user to copy, remove, and edit sounds in the System or any other file; and SndControl, which lets you assign a different sound to the start-up beep (as well as to other actions such as disk eject, insert, restart, and shut down) from the Control Panel. 512KE min. memory. \$25. Riccardo Ettore, 67 rue de la Limite, 19970, W-Oppem, Belgium.

SpeedLink Ethernet Adapters

Ethernet adapter for the Mac II, SE, and SE/30. Board plugs in to existing bus slots to provide transparent connectivity to existing networks using EtherTalk, DECnet, TCP/IP, and other protocols running over Ethernet. \$449. EMAC, 415/683-2222.

StickyBusiness Plus

Label-designing and -printing software that incorporates bar coding and postal formatting. Enables the user to create, position, size, and rotate bar codes; includes built-in address formats that meet all United States Postal Service standards for addressing business mail to be read and sorted by postal machinery. 1MB min. memory. \$170. Williams & Macias, 509/458-6312, 800/752-4400.

Studio/32

Color paint program that has all the features of Electronic Arts' Studio/8 and supports 1-, 4-, 8-, 16-, and 32-bit color. Includes a scanner utility; Pantone Matching System; four-color separation utility; three-dimensional perspective; file input and output for PICT, MacPaint, TIFF,

With the HP ScanJet Plus, you've

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for \$2,190,* about what you would expect to pay for a 4-bit scanner.

So if you want the richest, most detailed images from your Mac, you've got it made with Hewlett-Packard. Call 1-800-752-0900, Ext. 1005 for your authorized HP dealer.

There is a better way.



**HEWLETT
PACKARD**

Circle 344 on reader service card



For all its amenities, ease of use, good image quality, and low price, *Publish!* recommends the HP ScanJet Plus as their "Best Buy."



Studio/32

and EPS files; and online help. Requires a 24- or 32-bit color video board for true color display. 2MB min. memory. \$695. Electronic Arts, 415/571-7171.

Stuffit Deluxe

Enhanced version of the original Stuffit file-compression utility; includes the Magic Menu Finder Extension for point-and-click stuffing and unstuffing and for electronic mail transmission from the Finder. Has standard and expert operating modes. 1MB min. memory. \$99.95. Aladdin Systems, 408/685-9175.

Swivel 3D Professional

3-D sculpting and animation program based on the Swivel 3D interface with increased capabilities such as new smooth shading using a proprietary version of the Phong system; environment mapping, which allows the user to bring in any PICT file as an environment map that can be used to create reflective textures; eight independent light sources of varying intensity. Has 24-bit color output to a full screen or a 24-bit PICT file; also has DXF and RenderMan output. 4MB min. memory. \$695. Paracomp, 415/543-3848.



Swivel 3D Professional

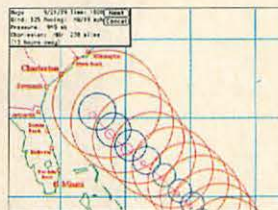
Techbase

Relational database-management system that enables the user to generate maps that can be used to graphically differentiate geological formations, property ownership, and mineral bodies, through the use of patterns and colors. Also has an applications generator that lets the user construct a data-input screen designed to meet a prescribed format. 1MB min. memory. \$2030. Microsoft, 303/292-6449.

TrakHur

Hurricane tracking system intended for tracking typhoons and hurricanes worldwide. Has more than 15 maps including the Atlantic and Pacific basins and surrounding coastal areas, Caribbean and Northwest Gulf areas, and others. User can input data as a storm is

TrakHur-Hugo89.PICT



TrakHur

brewing; program calculates number of hours it would take the storm to arrive at a specific location at its current speed. Also can be used to display tracks from past hurricanes. 512K min. memory. \$39.95. Hurricane Research Service, 512/836-7888.

WPduet and 100duet

WPduet enables users to connect the Macintosh directly to the WP-2 Tandy portable word processor for the purpose of file transfers. Includes file translators that convert WP-2 documents (*continues*)

got it made in the shades.



MAC SE 30
Fast 105 HD
19" BW RasterOps™ or 14" Color Monitor
5 Megs RAM
Extended KeyBD
Quickor Kare extended service

EVERY LEASE COMES WITH OUR EXCLUSIVE QUICKOR KARE EXTENDED SERVICE

THE EXECUTIVE PACKAGE
Package LP 60
List Price \$9,889

Wow!

Become Fast and Powerful Beyond Your Wildest Dreams with Our.... **NEW**

"HAVE IT ALL NOW FOR LESS LEASE"

from "America's Largest MAC Dealer"

THE POWER PACKAGE
• CX Power
• 5 Megs RAM
• New! Huge 170MB Internal HD
• 105 KeyBD

MAC II CX
\$430.³⁷ P/MO
DEPOSIT \$860.74

WE MAKE IT EASY WITH RUSH LEASE APPROVAL & OVERNIGHT DELIVERY

PLUS
• 19" Grey-scale Monitor
• Internal Modem
• QMS 810 Turbo Laser Printer

Package LP 14
List Price \$19,091

SEE OUR 3 OTHER ADS IN THIS ISSUE!

Mac Friends

800 331-1322
...or use our QUICKFAX (503) 255-0067
Call for America's Best Lease Rates!

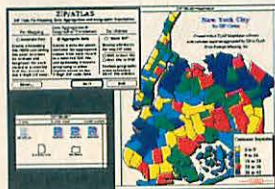
HERE'S HOW TO LEASE IT FOR LESS:
Call with your business info, trade refs and bank contact. We'll do the rest! FAST Delivery...you can count on it!

Circle 348 on reader service card.

directly into MacWrite II, Microsoft Rich Text Format, or ASCII files. 100duet performs the same functions for Connective to Tandy Model 100 and 102 laptop computers. 512K min. memory. \$99.95. Cabochon, 508/264-4648.

ZIP/Atlas

Desktop mapping utility converts any database or spreadsheet file containing zip codes into files that are compatible with Atlas Map-Maker software. Program can be used to map point locations of a name and address file, or to aggregate data by five-digit or three-digit zip-code areas, counties, states, or other areas. 1MB min. memory. \$195. Strategic Mapping, 408/985-7400.



ZIP/Atlas

ACCESSORIES

The Coach for PageMaker 4.0

Mouse pad with shortcuts and tips for using PageMaker 4.0. Has four areas of help: keyboard shortcuts, mouse shortcuts, typesetting hints, and general shortcuts. \$19.95 plus \$2 s/h. Binary Graphics, 206/447-0636.



The Coach for PageMaker 4.0

Computer Clothes

Dustcovers for computers, printers, and peripheral

devices. Styles are available for the Mac Plus and SE, Apple Macintosh II 12" Monochrome Monitor, 13" Color Monitor, 15" Portrait, and Radius Full Page Display monitors, as well as Imagewriter II, LaserWriter II, and HP DeskWriter. Custom covers available. \$15.95 to \$32.95. Computer Clothes, 412/343-7787.



The PaperKit

The PaperKit

Collection of more than 150 8 1/2-by-11-inch sample papers that can be ordered through Paper Direct for use with typewriters or printers. Comes with The PaperSelector, a set of paper swatches that demonstrate the design and texture of all papers offered by Paper Direct. \$14.95. Paper Direct, 800/272-7377.

Rolodex Die Cut Cards

3-by-5-inch die-cut rotary-file cards that come on 8 1/2-by-11-inch white index stock sheets that can be manually fed into a laser printer. Package also includes a layout grid. 400-card package \$25.90. Intergraphix, 617/826-7733, 800/451-2515. M

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number (and two copies of software) to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. We reserve the right to edit submissions.



People Working Better... Together

It's the edge your business needs to compete.

After all, success in today's economy isn't easy.

People working better together means increased productivity. And this is often the difference between success and failure.

Mainstay believes that software should help people work better together. No matter whether you're editing an important report electronically, tracking projects, sharing information over a network or even developing the flow relations for your production processes... *it's all about people working together.* And our software lets them do it better.



MarkUp™

Improve the efficiency of annotating and reviewing Macintosh documents.

MarkUp enables all your reviewers to annotate your document simultaneously. Without jeopardizing your original. Automatically merge all reviewers' comments together. They don't even need the same software you do. Just MarkUp.

And MarkUp even tracks who has reviewed which version of your manuscript.

Eliminate the paper and meetings from your review process.

Not convinced?

Order a 45-day evaluation copy of MarkUp for only \$10 by calling us.

"Users should find MarkUp easy to understand and work with in spite of its power and flexibility." MacWeek 12/12/89

MacSchedule™

Create attractive Gantt charts faster and easier.

MacSchedule gives you specialized drawing tools to quickly create professional looking schedules.

And you'll create your first schedule minutes after opening the package. It's a direct approach — not complicated CPM or PERT software.

Use MacSchedule to track a project's cost too. Display actual vs. budget performance with its spreadsheet and graphing features.

Try it — you'll use it for all your projects.

Call us today for more info and a free demo disk.

"MacSchedule should be considered by anyone who has to plan and co-ordinate jobs and projects." MacUser, May 89

MarcoPolo™

Find what you're looking for, when you need it.

MarcoPolo is a new approach to sharing and retrieving Macintosh documents. It lets you search through all types of Macintosh documents by content! (Or by creation date, author, title and keyword.)

MarcoPolo then displays all of these documents side by side. Imagine viewing letters, spreadsheets, drawings, page layouts, email, bills, reports — all at once.

Order a 45-day evaluation copy of MarcoPolo for only \$10 by calling us.

"MarcoPolo should prove very useful in design group settings where files are often accessed from a central location." Macintosh Aided Design, June 1990

MacFlow™

Create flow charts up to 10 times faster than with drawing programs.

Simply drag flow chart symbols into place, supply text and connect them with flow lines. Move symbols and the "rubber band" flow lines stay connected.

Use ANSI standard or create your own custom symbols.

Create project, operation, logic or process flows. Quickly design troubleshooting diagrams, organization charts, etc.

Want to know more?

Call us today for more info and a free demo disk.

"MacFlow can help you... generate smashing ideas with a single investment." PCAI May 89

Mainstay

5311-B Derry Avenue 71 rue des Atrebatas
Agoura Hills, CA 91301 B-1040, Brussels, Belgium
(818) 991-6540 322/733.97.91

We developed Pacific MacPage because affordable PostScript® printers are just a dream.



Imagine buying an Apple LaserWriter IINT. Or IINTX. The price tag can cause nightmares.

So, consider Pacific MacPage. It brings the quality output of a PostScript printer within reach. Just plug one of our cartridges into a HP LaserJet II, IIP, IID* or III printer with 2 megabytes of additional memory.

The results are beautiful. Pacific MacPage supports Adobe Type 1 fonts and is compatible with Adobe Type Manager. Plus, it has 35 LaserWriter IINT equivalent font families. You'll get quality output with every character. And you'll get it fast.

Benchmarks show Pacific MacPage on the IIP prints an average of 10% faster than the LaserWriter IINT with most applications.

Pacific MacPage can help make your dream of the affordable printer a reality. To learn more, call or write: Pacific Data Products, 9125 Rehco Road, San Diego, CA 92121, (619) 552-0880. Fax (619) 552-0889.



PACIFIC
DATA PRODUCTS

*IID duplexing feature not supported in PostScript mode.

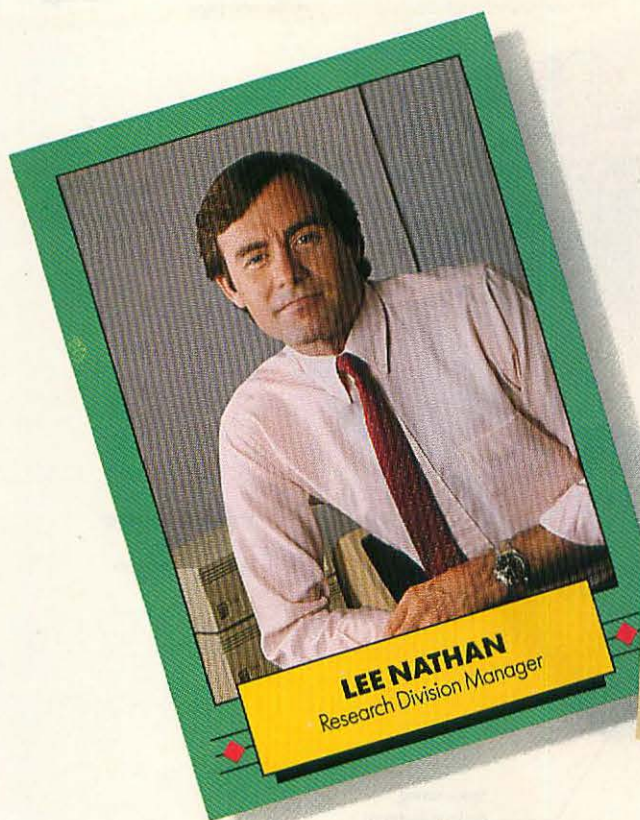
© Copyright 1990 Pacific Data Products, Inc. PhoenixPage is a registered trademark of Phoenix Technologies Ltd. Copyright 1987, 1988 Phoenix Technologies Ltd. MacPage and MacPage P.E. are trademarks of Pacific Data Products, Inc. PostScript, Type Manager and Type 1 are registered trademarks of Adobe Systems Inc. Apple, Macintosh and LaserWriter IINT and IINTX are registered trademarks of Apple Computer Inc. LaserJet Series II, IIP, IID and III are registered trademarks of Hewlett-Packard. All other company and product names are trademarks of the company or manufacturer respectively.



Circle 378 on reader service card

Big-league stats for the serious player.

Call Now For A
Free Brochure Diskette



LEE NATHAN

Research Division Manager

CAREER HIGHLIGHTS:

- 1982** Used SPSS data analysis system on VAX™ mainframe for customer surveys. Eliminated outside costs of more than \$75,000.
- 1984** Designed sales-lead tracking system, using SPSS data management and charts. Slashed overhead costs—and gave more accurate results in half the time.
- 1986** Promoted to Manager of corporate-wide research and strategic planning staff, in recognition of outstanding contributions to overall profits.
- 1988** Put Macs on employee desktops, dramatically boosting productivity.

Another Story in the SPSS SUCCESS SERIES

When you want more data analysis power from your Macintosh®, the only game in town is SPSS®.

When you've got to know the score, you need more than an ordinary stat package. You need the most powerful data analysis software ever created for the Macintosh: SPSS.

Only SPSS for the Macintosh gives you all the same analytical capabilities as our legendary SPSS mainframe and workstation software.

So you get more ways to turn data into knowledge.

Our Macintosh user interface puts you in control of data and file management. Basic and advanced statistical procedures like time series analysis and forecasting, nonlinear regression, discriminant analysis and more. Plus award-winning presentation graphics and tables to let you display your results.

In short, you get more statistical methods and features with SPSS than with any other Mac software.

And SPSS also gives you one other

vital feature: the SPSS support team that's come through for over a million users in the last 20 years.

So if you're serious about winning, don't settle for anything less than the power you need. Find out more about SPSS by calling

1-312-329-3323.

And get the knowledge to be first in your field.

SPSS inc.

Best in the final analysis.

444 North Michigan Avenue, Chicago, Illinois 60611
SPSS International BV: Avelingen West 80,
P.O. Box 115, 4200 AC Gorinchem,
The Netherlands

XEROX

It reads reversed elements.

It can read everything on the previous page.

First-in, first-out document feeding of up to 50 pages.

It can even read everything on the next page.

Removable sheetfeed for multiple applications.

Bevelled edge for bound books.

Allows perfect re-registration of graphics.

Recognizes and stores images (like this photo).

1 pixel jitter resolution for clearer images and better accuracy.

8-bits and 256 gray levels.

Space saving desktop footprint.

Versatile flatbed design can scan up to legal size documents.

Introducing the new scanner that can read everything on this page.

The new Datacopy GS plus scanner is the fastest desktop scanner in its class. It lets you step instantly into high volume, high-quality scanning. Text. Images. It's the desktop publishers ideal scanning tool.

The scanning package includes compact, easy-to-use software tools for importing text and graphics. Available for both PC and Mac platforms.



Optional *Gray F/X* software gives you state-of-the-art grayscale editing capabilities. Now you can enhance your photos like professional photolabs.



Optional *AccuText* software allows you to input documents into your computer electronically. This powerful intelligent character recognition software lets you read almost any typestyle imaginable. The ultimate productivity tool.



Powerful text scanning capabilities.

For more product information, call us today.
1-800-248-6550

Xerox Imaging Systems, Inc.

The triumph of mind over paper.

Copyright 1990 by Xerox Imaging Systems, Inc. Datacopy GS plus, Gray F/X and AccuText are trademarks of Xerox Imaging Systems, Inc. All other product names are trademarks or registered trademarks of their respective holders.

Circle 376 on reader service card

Quick Tips

FINDING MISSING DISK SPACE, ARRANGING PAMPHLET PAGES, HANDLING INCIDENTAL CHARGES, AND MORE

BY LON POOLE

The standard colors for the *z*-axis (height) of a 3-D surface or contour plot in Wingz are none too charming. A tip published here in April featured a Wingz script for converting the haphazard color scheme to a smooth gradation of gray shades.

Christopher Caswer of West Henrietta, New York, modified that script to produce smooth multicolor shading (see "Color Variations"). Colors range from dark blue for the lowest values on the *z*-axis to light blue, green, yellow, orange, and red (see "Color Shading"). Caswer also suggests turning on chart smoothing. First select the chart and choose the Chart Info command (Format menu). Then in the dialog box select the Smoothing option and enter the number of segments you want. Smoothing results in a smoother plot but one that takes longer to draw. The more segments you specify, the longer the drawing process. You can make Wingz stop redrawing at any time by pressing ⌘- (period).

RAM Advantages

Q My lab is purchasing a Mac IIci with 5MB of RAM. What are the advantages of all this memory? I know it will let me use MultiFinder, but what else can I do? What effect does increasing the RAM cache setting in the Control Panel have? I use Microsoft Word quite a bit. Should I increase the RAM cache and have the program loaded into memory?

Leonard Malkin
Detroit, Michigan

A Unless you use only one application, I think you'll find the ability to run under MultiFinder a major

benefit. MultiFinder lets you have two or more programs open at once and switch instantly from one open program to another. This quick switching makes cutting and pasting between programs a snap. With MultiFinder active, the Finder remains open for tasks like naming and copying disks, folders, and files. You also get better memory management—fewer system crashes—with MultiFinder active.

With or without MultiFinder active, programs like ColorStudio, Illustrator 88, PhotoMac, Photoshop, and PixelPaint require 2MB to 4MB. These programs, as well as others with more modest memory requirements, take advantage of additional available memory to let you open more documents at once, to work on larger documents, or to do both. Programs that place few restrictions on the number of open documents may operate faster because more of the application and the open documents fit into memory simultaneously, reducing the need for disk accessing.

You can always use extra memory for system software enhancements besides MultiFinder. Adding goodies to the System Folder—Adobe Type Manager, After Dark, MasterJuggler, QuickMail, TOPS, Virtual, and so on—can easily increase system memory beyond 1MB. What's more, System 7.0 will require at least 2MB—double the minimum you need for System 6.0.5.

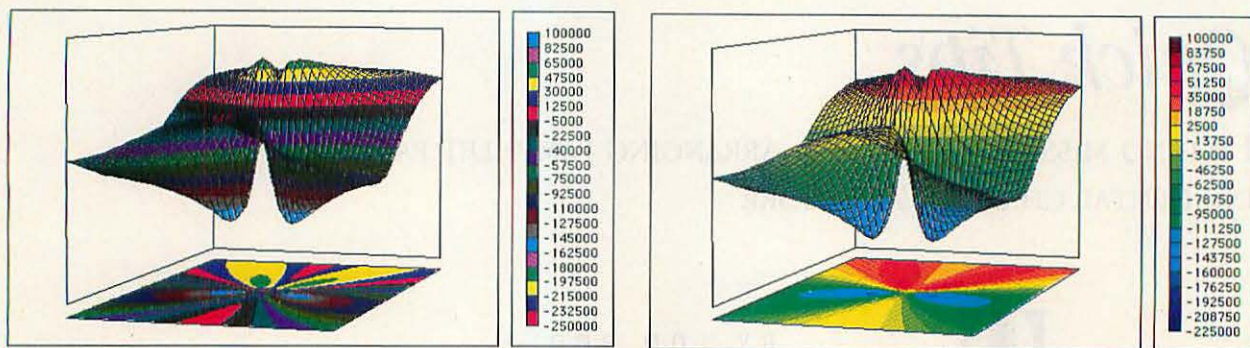


Turning on the Control Panel's RAM Cache option sets aside some RAM as a storage area for information recently retrieved from disk. If that information is needed again, it can be copied quickly from the RAM cache instead of more slowly from disk. A cache of moderate size, say 128K, speeds up program operation, though not dramatically. I have heard, but have been unable to substantiate, that a cache 256K or larger may actually slow down program operation. Some programs work as well or better with the RAM cache set to Off. HyperCard, for example, has its own cache and works faster when the Control Panel RAM Cache is set to Off.

Microsoft Word has its own special options for keeping the whole program, document, or both in memory. To set these options, use Word's Preferences command (Edit menu).

Lost Space

Q Although my hard disk indicates it has 9945K in use, when I add up the space actually used by each file, (continues)



Color Shading

Standard colors in Wingz surface and contour graphs don't provide useful shading information (left). Applying the script in "Color Variations" to those graphs achieves smooth color shading (right).

COLOR VARIATIONS

This Wingz script applies smooth color shading to a surface or contour graph. The script remaps the z-axis to have 20 zones or divisions. Each zone is a slightly different color than the zones immediately above and below it. You can set any number of zones between 6 and 50 by editing the line **ZONE = 20**.

```
{Define the}
{variables needed}
{for the script}

{"chartnum" refers to}
{the selected chart}
DEFINE chartnum

{"min" and "max" are the}
{minimum and maximum}
{values on the Z-axis}
DEFINE min, max

{"Z" and "Z1" are}
{the current Z-axis}
{division and subdivision}
DEFINE Z, Z1

{"R,"G," and "B" are the}
{the red, green, and blue}
{color components for the}
{current Z-axis division}
DEFINE R, G, B

{"zones" is the number of}
{color zones (divisions)}
{on the Z-axis}
DEFINE zones
zones = 20

{"gain" is the amount to}
{change a color's intensity}
DEFINE gain
gain = 1275/zones/10

{prevent redrawing the}
{graph}
REPAINT OFF

{get the number of the}
{selected chart}
chartnum=number()

{select the Z-axis}
SELECT CHART
chartnum AXIS 3

{get the minimum and}
{maximum Z-axis values}
min=SCALEMINIMUM()
max=SCALEMAXIMUM()

{set Z-axis scaling and}
{number of major divisions}
MANUAL SCALING
FROM min TO max
WITH zones MAJOR AND
1 MINOR DIVISIONS

{initialize the color values}
R = 0
G = 0
B = 127.5

{loop through each color}
{zone (Z-axis division)}
FOR Z = 1 TO zones

{loop through each}
{Z-axis subdivision}
FOR Z1 = -.9 TO 0 STEP .1

{calculate the RGB values}
{for this zone}
CASE
WHEN Z + Z1 <= .1*zones
B = B + gain
WHEN Z + Z1 > .1*zones
AND Z + Z1 <= .3*zones
G = G + gain
WHEN Z + Z1 > .3*zones
AND Z + Z1 <= .5*zones
B = B - gain
WHEN Z + Z1 > .5*zones
AND Z + Z1 <= .7*zones
R = R + gain
WHEN Z + Z1 > .7*zones
AND Z + Z1 <= .9*zones
G = G - gain

{end subdivision loop}
END FOR

{select the zone (the}
{Z-axis division)}
SELECT CHART chartnum
SERIES Z

{set the zone's color}
FILL FG RGB (R,G,B)

{end zone (division) loop}
END FOR

{minimize chart redrawing}
SELECT CHART chartnum

{now redraw the chart}
REPAINT OBJECTS
```

the total is only 8661K. Where is the unaccounted for 1284K?

Fred Schreiber
Riverdale, New York

A Your disk may have a bloated Desktop file. That file, whose icon is invisible, records copies of icon images for most applications and docu-

ments, Get Info comments, and other information for the Finder. The Desktop file initially occupies 6.5K on an *(continues)*

SCOTT WATSON'S

White Knight™

AWARD WINNING COMMUNICATIONS SOFTWARE FOR THE MACINTOSH

IT'S EASY TO WRITE AN ADVERTISEMENT WHEN YOU ALREADY HAVE THE BEST ADVERTISING MONEY CAN'T BUY

"White Knight looks and feels very similar to Red Ryder 10, but when you take a close look you discover that many things have changed. The number of new features is fairly large. There are also some improvements to old ones. Red Ryder may be gone but White Knight continues a tradition of excellence."

AUSTRALIAN MACWORLD

"Originally titled Red Ryder, this program has evolved into a slick, complete and easy-to-use program. A novice can have it running with little effort, yet it has almost all the features the big boys need. This is one of the few remaining companies whose president (the program's creator) answers phone calls and gives technical support. The manual is written in a colloquial style that's entertaining as well as informative."

CRAIG CROSSMAN, TECHNO-FILE

"For Mac novices, White Knight is the best all-around telecommunication program. For procedure writing, it is the simplest. For ease of use I strongly recommend this program."

ACTIVE WINDOW

"White Knight is probably the best communications program on the market, combining technical sophistication, flexibility, user-friendliness and a bargain basement price - \$139. It deserves more than an unqualified recommendation. It should be a mandatory buy for anyone with a Macintosh and a modem. Watson is a former writer-editor and the manual is the best read I've seen in computer documentation."

COMPUTER COMMENT

BY JACK LESAR, UNITED PRESS INT'L

"White Knight is one of the best values in communications software, and with Okyto thrown in (a \$39.95 value when purchased separately), it's an even better bargain. White Knight continues the tradition of supporting every possible feature that its users could want and then some and with RCMDs you can add features even Scott Watson couldn't think of."

MACUSER

"In the halls of Macintosh telecommunication, there is no name greater than Red Ryder...but now it's called White Knight 11. Many of the changes in this metamorphosis to White Knight will help the special-needs user. ... you'll find a lot of things to make your time online easier. While reading the expanded manual, you'll see dozens of features you may not think you'll use. Once you try them, however, they'll become indispensable. If you're new to the telecom adventure, you'll appreciate the thought that went into making things easier to learn; White Knight will even write procedures for you, if you'd like."

COMPUTER SHOPPER

"... White Knight is the precision tool of communications programs."

MACWORLD MAGAZINE

"The FreeSoft Co.'s White Knight 11 is priced at half the cost of Microphone. It's a powerful general-purpose telecom program that packs in almost every imaginable feature. It has a very capable scripting language that is now extensible via proprietary RCMDs and has an excellent range of file transfer protocols, including ZMODEM."

MacWEEK

Because we insist that White Knight be a COMPLETE communications package, we have decided to ship with each copy of White Knight a FREE copy of Okyto, a revolutionary Macintosh-to-Macintosh file transfer program, and a \$39.95 value!



Even if you have never touched a modem, Okyto can have you transferring files ERROR FREE like a pro in just a few minutes, with the remote machine attended or unattended! Please call or write us, or contact your local dealer for full product information.

The FreeSoft Company

105 McKinley Road ■ Beaver Falls, PA 15010 ■ (412) 846-2700

Reprinted from MacWeek, February 13, 1990, Copyright © 1990, Coastal Associates Publishing LP. Reprinted from MacUser, May 1990, Copyright © 1990, Ziff Communications Company

Circle 6 on reader service card

Global ReLeaf comes in all shapes and sizes.



It's a fact. Planting trees is one of the best and easiest ways to help reduce global warming and other serious environmental problems.

That's why thousands of Americans — of all shapes and sizes — are doing their part for Global ReLeaf right in their own communities. And it's why we need more trees to shade our homes, beautify our town and country landscape, and reduce the heat-trapping CO₂ build-up in the earth's atmosphere.

So grab your shovel and start planting. And call our special Action Line — 1-900-420-4545. The \$5.00 charge actually pays for planting a tree while supporting Global ReLeaf action across the country. And, we'll also rush you detailed information on Global ReLeaf. You can make a world of difference.

1-900-420-4545



A program of The American Forestry Association

Citizens caring for trees & forests since 1875 P.O. Box 2000, Washington, DC 20013

QUICK TIPS HOW TO

800K disk, 11.5K on a blank 1440K floppy disk, 32K on a blank 45MB hard disk, and so on. Not surprisingly, a disk's Desktop file grows if you add lots of files to the disk. However, an enlarged Desktop file does not shrink when you remove files. Icons belonging to deleted files may needlessly enlarge the Desktop file.

You can reduce a disk's Desktop file to its minimum size by pressing the ⌘ and Option keys before the disk's icon appears on the desktop. That occurs when starting up, when quitting a program with MultiFinder inactive, and when inserting a floppy disk. The Mac asks if you're sure you want to rebuild the desktop. Warning: If you answer yes, any comments you have entered in Get Info boxes will be lost. To preserve Get Info comments, use a special utility program such as DiskExpress from AlSoft (713/353-4090) to rebuild the Desktop file.

If rebuilding the Desktop file does not recover most of the missing space, then your disk may contain other invisible files. A few applications also create invisible files that could be using space on your disk. To see all files on a disk, including invisible ones, use a utility program like DiskTop from CE Software (515/224-1995).

Paired Marks

TIP: Microsoft Word 4.0 doesn't have a command for putting paired quotation marks, parentheses, or brackets around the current text selection, but you can use MacroMaker to create that missing command.

1. Select some text in Word and choose Start Recording from the MacroMaker menu.

2. Press ⌘-X and then ⌘-Z to delete and then restore the selected text. This teaches Word where the selection starts and ends.

3. Press the right-arrow key to go to the end of the selection. Type a closing quotation mark (Shift-Option-] in most fonts), right parenthesis, or other ending punctuation mark.

4. Press 0 on the numeric keypad or ⌘-Option-Z to go back to the beginning of the selected text. Type an opening quotation mark (Option-[), left bracket, or other beginning punctuation mark.

(continues)

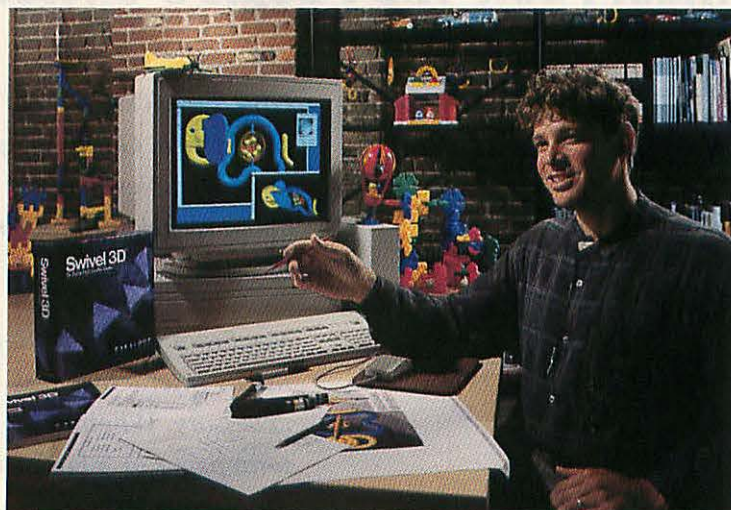
THE BEGINNING OF SWIVELIZATION.



Swivel 3D[™], the award-winning 3D graphics program, helped Dan Klitsner from Klitsner design land a major project with Discovery Toys. His ideas were quickly brought to life on the Macintosh and ready for his clients to view. Using Swivel 3D, Dan built a working model of the rattle that behaved just like the final product. Convincing each department was easy ... Marketing understood how to sell the product, engineering saw how the parts would fit together and move, and the product development team was able to efficiently move the project along to completion. First conceived with Swivel 3D, the elephant rattle -- Tons of Fun -- has become one of Discovery Toys' top-selling products.

"With Swivel 3D, I designed an elephant-shaped rattle for Discovery Toys. Created to help the coordination and two-handed development of infants, the design needed to have moving, linking parts. Swivel 3D was my tool of choice."

*-Dan Klitsner,
Klitsner design*



For more information on how to create your own success story with Swivel 3D call Paracomp today.

P A R A C O M P

1725 Montgomery Street,
2nd Floor
San Francisco, CA 94111
Tel: 415-956-4091 x100
Fax: 415-956-9525

Requirements: Apple Macintosh[®] personal computer. Min. 1 meg. Swivel 3D is a trademark of Young Harvill/VPL Research, Inc. © 1990 Paracomp, Inc. All rights reserved.

Circle 229 on reader service card



MacProof. The People's Choice for Better Writing.

AT LAST.

PERFECT PROPOSALS,
PROFESSIONAL LETTERS
AND POLISHED TERM
PAPERS.

Grin the wicked grin of confidence. Get to the point. Organize. Never worry about mistakes in spelling or usage.

MacProof is an easy-to-use, totally interactive desk accessory. Whether it's a term paper or a business proposal, a letter or manual, a sermon or a speech, MacProof can help you refine your writing until it's letter perfect.

MacProof. Proofreading and text-revision software for the Macintosh by Lexpertise. Now for only \$195.00 (suggested retail price). PC Proof available for IBM and compatibles. For more information, contact your local dealer or call toll free 1-800-354-5656.

Requires 1MB of memory. Format compatible with: MacWrite 4.6 and 5.0, MacWrite II 1.0, Microsoft Word 4.0, MindWrite 1.0 and 2.0, PageMaker 3.0. (Requires 2MB for PageMaker.) Check with Lexpertise for further information on product compatibility. Trademarks belong to their respective manufacturers.

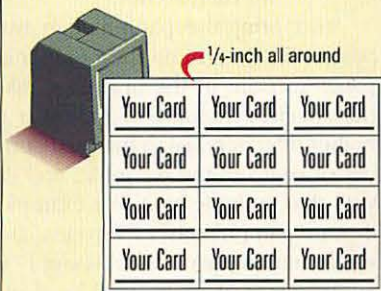
Circle 183 on reader service card

MacProof

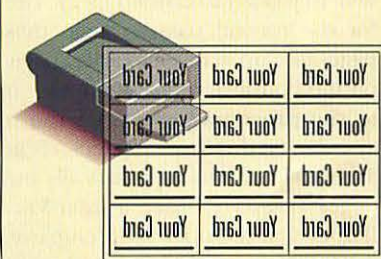
YOUR ENGLISH PROOFREADER BY LEXPERTISE

PRINTING CARDS BY LASER

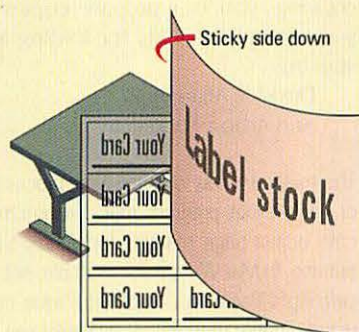
Alex Narvey of Winnipeg, Manitoba, devised this quick and easy way to print durable plastic-covered cards using a LaserWriter. You can use them for name tags, address change notices, cabinet labels, and so on. The toner is protected from cracking by being sandwiched between sticky label stock and transparency film. The price per hundred is about \$5.



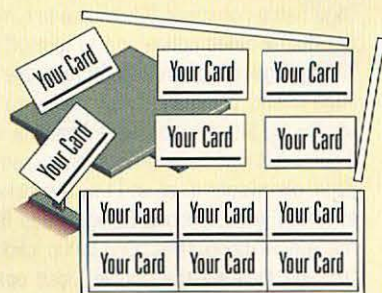
Using a graphics program, lay out an 8 1/2-by-11 page with as many cards as you can fit (here we show business cards). Be sure to leave a 1/4-inch margin on all four sides of the sheet.



Using the Apple LaserWriter driver, print a mirror image of your cards on a sheet of transparency film. Choose the Page Setup command (File menu), click on the Options button, and check the Flip Horizontal and Larger Print Area options. Using PageMaker 3.02, check Spot Color Overlays in the Print dialog box (File menu). Click on the Changes button and Mirror option.



Peel the backing off a sheet of solid, sticky-back label stock (Avery #5353 or equivalent). Carefully press the toner, or wrong-reading, side of the transparency sheet to the sticky side of the label stock.



Cut out the individual cards using a pair of scissors, a paper cutter, or an X-Acto knife. Remember to trim away the 1/4-inch margin.

Mac Friends
AMERICA'S MAC ONLY STORE

LEASE YOUR BUSINESS MAC SYSTEM AT AMERICA'S BEST RATES!

MAC II cx \$231/mo
DEPOSIT \$462.97

PUBLISHING PACKAGE #12

- Mac IIcx Power!
- 5 MB RAM
- Extended Keyboard
- Fast Quantum 80 MB HD
- 19" B/W Monitor
- Quicken Kare Extended Service Program

Package LP 12
List \$9,752
Price \$9,752
Next Day Delivery

800 331-1322
... or use our speedy QUICKFAX (503) 255-0067

Mac Friends
LEASE MAKES LEASE AFFORDABLE! LEASE MAKES LEASE AFFORDABLE! LEASE MAKES LEASE AFFORDABLE!

CONSIDER THE ADVANTAGES

- Leasing is fast and easy!
- Get much more for your budget. Payments can be tax deductible!
- Conserve your working capital.
- Have flexibility to expand.

CALL WITH YOUR TRADE IN! GET A BANK GUARANTEED RATE! WE'LL PAY THE RESIDUAL!

MAC II cx \$272/mo
DEPOSIT \$344.82

PRO-GRAPHICS PACKAGE #72

- Super fast Mac IIcx!
- Huge Quantum 170 MB HD
- 5 MB RAM
- 105 Extended Keyboard
- 13" Sony Color Monitor
- Quicken Kare Extended Service Program

Package LP 72
List \$11,617
Price \$11,617

SEE OUR 3 ADVERTISING ISSUES!

Circle 345 on reader service card.

Call,
scream,
bark, or
whistle
right now
and
receive over
one hundred
sounds
for your
applications.



Ten Disks For Only \$99.

Don't prepare a presentation halfway. Go the distance and add high-quality professional sounds. Easily installed in HyperCard™ or other applications, SOUND-CLIPS adds a completely new dimension to any presentation.

Call us for the dealer nearest you and information on the rest of the TACTIC Software line, which includes FONTSHARE, ICON-IT!, (a completely new version of this best-selling utility), ART CLIPS, and our new utility CLAIRVOYANT.



TACTIC Software

11925 S.W. 128 Street, Miami FL 33186

Fax 1-305-232-7467

1-800-344-4818

Circle 502 on reader service card.

QUICKTIPS

HOW TO

Purchase Orders			
Order Number: 1001			
Deliver To: Coral Springs Technologies			
Department: Purchasing			
Date Wanted: 12/12/90			
Quantity	Item	Unit Cost	Total Cost
2	Overhead Projector	\$142.00	\$284.00
2	16mm Projector	\$254.00	\$508.00
4	Compact Disc Player	\$158.36	\$633.44
	Shipping	\$30.00	\$30.00
	Tax	\$10.00	\$10.00
Total			\$1465.44

5. Choose Stop Recording from the MacroMaker menu. Name and store the macro and then close the MacroMaker window.

A similar macro removes paired punctuation marks from the beginning and end of the current text selection. Follow the steps above, but in step 3 press Delete or Backspace instead of typing a closing punctuation mark, and in step 4 press ⌘-F instead of typing an opening punctuation mark.

John Broadbent

Golden Valley, Minnesota

Pamphlet Page Arrangements

TIP: Arranging pages of pamphlets, catalogs, and other small publications in the correct sequence can be tricky if you're printing two pages per sheet of paper. Each page should fill half the sheet so that when the paper is folded and stapled you'll have a little booklet. In Microsoft Word with Full Menus selected, choose the Page Setup command (File menu). In the resulting dialog box, set landscape (sideways) orientation and then click the Document button. In the dialog box that appears, turn on the Mirror Even/Odd Margins option. If you wish, turn on the Even/Odd Headers option. Enter the top, bottom, and outside margins you want. Then add 5½ inches (the width of one page) to the size of the inside margin. Click OK as needed to dismiss the Document format and Page Setup dialog boxes.

If you set the Even/Odd Headers option, the Document menu will have separate commands for even and odd headers and footers. Typically, you would align the page numbers in the odd header or footer on the right and align the page numbers in the even header or footer on the left. If you're

Incidentally

If you list tax, shipping, and other incidental charges along with items ordered, but don't enter a quantity for those charges, you need a special formula to compute the total cost.

using section breaks in a document to separate different chapters, you may wish to set the Start option to Odd Page using the Section command (Format menu) for each section.

You print the pamphlet in two passes. To determine the number of pages to print in the first pass, take the smallest multiple of four that is higher than or equal to the total number of pages in the pamphlet and divide that multiple by 2. For example, if your pamphlet has 17 pages, the smallest multiple of 4 containing 17 is 20. In this case, you would print the first 10 pages (20 divided by 2). Then for the second pass, arrange those pages face up in reverse order (page 1 on the bottom), return them face up to the paper tray, and print the remaining (in this case, 7) pages. (Note: a LaserWriter Plus automatically puts pages in reverse order; a LaserWriter II does so if you open its face-up exit.)

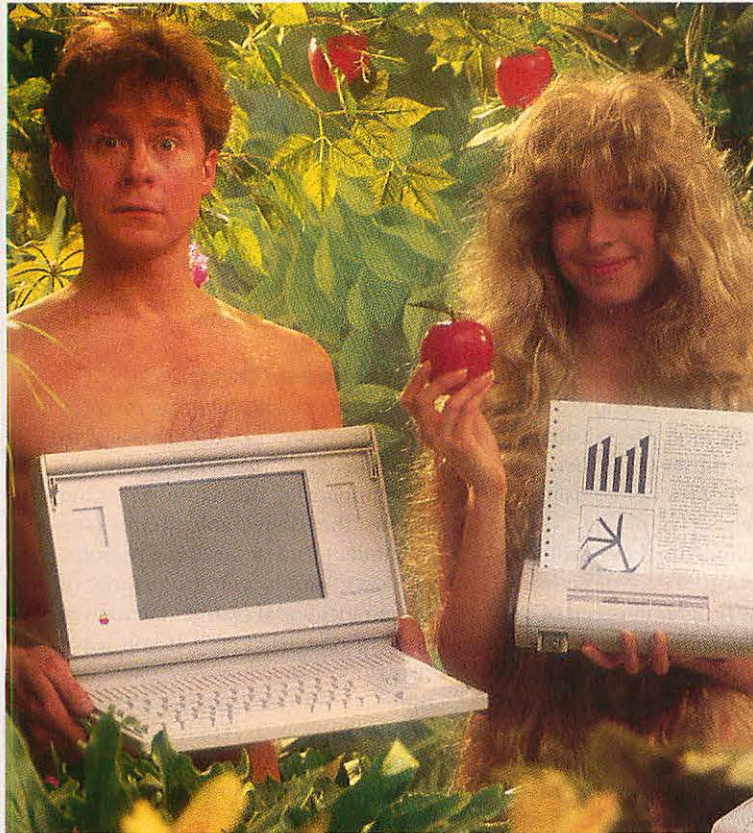
You now have a set of single-sided originals, each bearing two pamphlet pages. By appropriate double-sided copying, you can prepare copies of your pamphlet ready for folding and stapling.

David S. Allan

Ann Arbor, Michigan

This method works with any word processing or page-layout program that can automatically adjust page margins for double-sided printing. In MacWrite II, for example, set the Left/Right Pages option of the Pages command (Format menu). In PageMaker use the Page Setup command (File menu) to turn on the Double-sided option and to turn off the Facing Pages option. In QuarkXPress, use the Page Guides command (View menu) to set the Double Sided option, to set margins, and if printing in landscape orientation, to specify paper dimensions (such as 11 by 8½ inches). In ReadySetGo, choose Design Grids from the Special menu, select Grid Setup, click on OK, and then set the Double Sided option and enter the margin settings. —L.P.

(continues)



Introducing the Kodak Diconix M150 plus printer. Don't take a Mac anywhere without one. Now you can print out a sudden revision, a quick letter, an instant overhead anywhere!

Just think of all the things you can do if you have a printer with your Macintosh computer. Those last-minute improvements on the presentation. And the letters and reports that could be on their way right now. Then there's the sheer convenience of being able to read what you write before you get back to the office.

It's all easy if you have the new Kodak Diconix M150 plus printer. It's easy to carry (3.1 lbs.), prints PostScript®-quality outline fonts using Adobe Type Manager™ software, as well as presentation graphics. And it works as well on the desktop as it does on the road. No printer in the world is quieter, smaller or lighter.

Go ahead, give in to temptation, call for the name of your nearest dealer in the U.S. or Canada: 1 800 255-3434.



Macintosh computer and new Kodak Diconix printer

WHAT'S ONE WITHOUT THE OTHER? KODAK

The new vision of Kodak



At Bitstream, the Futura is now.

Light
Light Italic
Book
Book Italic
Medium
Medium Italic
Heavy
Heavy Italic
Bold
Bold Italic
Extra Black
Extra Black Italic
Light Condensed
Medium Condensed
Bold Condensed
Bold Condensed Italic
Extra Black Condensed
Extra Black Condensed Italic
Futura Black

The Bitstream® Typeface Library for the Macintosh® has the most complete families, with all the varied styles you need.

You can enhance your creativity with light, black, and condensed styles. Thanks to Bitstream, the Futura® is looking a whole lot brighter.

Become a friend of the family. Circle the Reader Service number below for a **free** catalog. To order type, call Bitstream at **1-800-237-3335**.


Bitstream is a registered trademark of Bitstream Inc. Futura is a registered trademark of FontShop Typografie Neufville S.A. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 511 on reader service card.

Expediting WriteNow 2.2's Thesaurus

TIP: The version of WordMaster Thesaurus that comes with WriteNow 2.2 doesn't work with other programs. It shows up in the Apple menu even when it's not usable. Worse, if MultiFinder is active, an annoying alert reminds you of this restriction whenever you choose WordFinder from the Apple menu—even if you're using WriteNow at the time. After dismissing the alert, you must switch from the DA layer to WriteNow before using the thesaurus. Ugly.

You can eliminate these problems by installing WordMaster directly into the WriteNow program instead of into the System file. Here's how.

1. After installing WordMaster as instructed in the WriteNow manual, open Font/DA Mover (there's a copy on WriteNow Disk 3). Select the Desk Accessory option at the top of the Font/DA Mover window. On the left side of the window is a list of the DAs installed in the System file. WordMaster should be on the list.

2. Press the Option key while clicking the Open button on the right side of the window. Open your working copy of WriteNow 2.2. (If you can't find WriteNow, you didn't press the Option key while clicking Open.)

3. Select WordMaster on the right-hand side of the window and click the Copy button. After Font/DA Mover copies WordMaster into WriteNow, click the Close button on the right side of the window.

4. With WordMaster still selected on the left side of the window, click the Remove button. Authorize removal of this copy of WordMaster when asked to do so. Click the Quit button and you're done.

Caution: If you later install another desk accessory in the System file, it may conflict with the copy of WordMaster in WriteNow. This can happen because the Font/DA Mover doesn't correlate the ID numbers of desk accessories in multiple files. Anything may happen if you try to use a desk accessory that has the same ID number as another desk accessory you're already using. To eliminate conflicts after installing a new desk accessory, copy WordMaster from WriteNow to the System file, remove WordMaster from WriteNow, copy WordMaster

back to WriteNow from the System file, and remove it from the System file. You can also eliminate conflicts by putting Suitcase II or MasterJugger in your System Folder.

Ron Risley
San Diego, California


Computing Incidental Charges

TIP: If you use FileMaker for invoices or purchase orders, you may want to list incidental charges such as sales tax and shipping in the same repeating field as the deliverable items (see "Incidentally"). For aesthetic reasons, you don't want to enter a quantity of 1 for an incidental charge. (Who ever heard of one sales tax?) If you leave the quantity blank, however, FileMaker computes the total cost of the incidental charge as 0. (Total cost equals quantity times unit cost.) To avoid the problem, use the following formula to calculate total cost:

IF(Item="","",IF(Quantity="",Unit Cost,Quantity*Unit Cost))

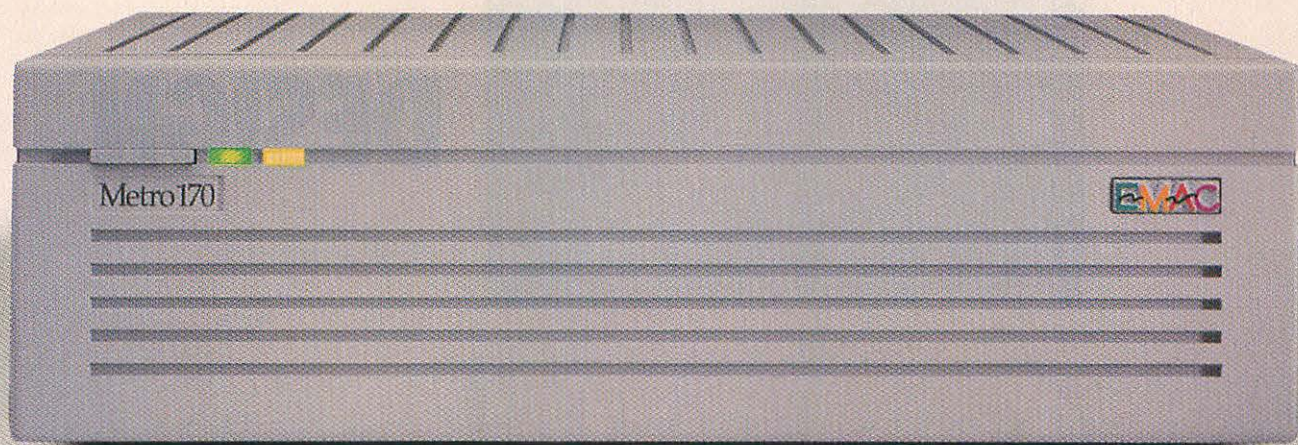
The formula stipulates that nothing ("") be put in the Total Cost field if there is nothing in the Item field. If there is something in the Item field but nothing in the Quantity field, then the Total Cost field equals the Unit Cost field. If the Quantity field is not empty, then the total cost equals the quantity times the unit cost.

Peter Theodoroff
Coral Springs, Florida

.....
We pay from \$25 to \$100 for tips published here. Send tips or questions (include your address and phone number) to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702) or MCI Mail (294-8078). All published submissions become the property of Macworld. 

Lon Poole answers readers' questions and selects their tips for this monthly column. He has written many personal computer books, including the quick reference HyperTalk (Microsoft Press, 1988) and a new book of Mac tips (to be published soon by Microsoft Press), Amazing Mac Facts.

It's like owning a disk drive with a bulletproof vest.



Introducing the Metro with SCSI Sentry

EMAC has found a way to prevent unnecessary Macintosh hard drive fatalities with SCSI Sentry,™



an engineering breakthrough in disk drive reliability. It protects your disk drive from damaging shorts that can trap data inside your hard disk. Which makes any drive with the SCSI Sentry

substantially more reliable.

And only EMAC Metro drives have it.

Metros are zero-footprint disk drives — so they fit perfectly under a Mac Plus or SE. You can also stand Metro on its side next to any Mac II, keeping your desk free for papers, phones, or photographs.

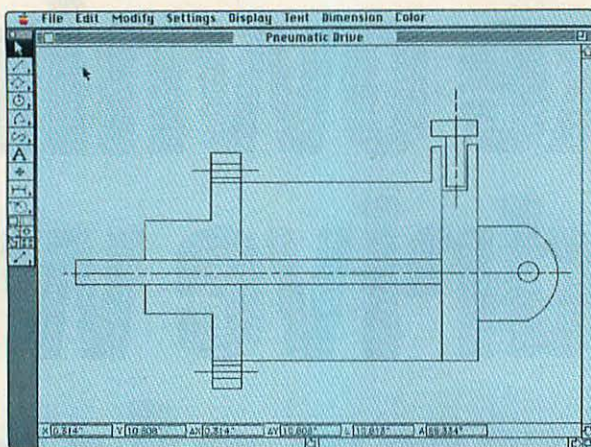
But Metro's engineering goes far beyond pure aesthetics. With some of the most stringent testing in the market — and mean-time-between-failures ratings of 50,000 to 70,000 hours — these drives were built to keep you up and running. And, if your Metro drive ever does have problems, our modular design makes diagnosis and repair quick and easy.

When you add the SCSI Sentry to such reliable disk drives, you know your data's safe with Metro. If you want to own a disk drive with a bulletproof vest, call EMAC at 1-800-821-0806, extension 2222. It's just one more way that EMAC gives you more for your Mac.

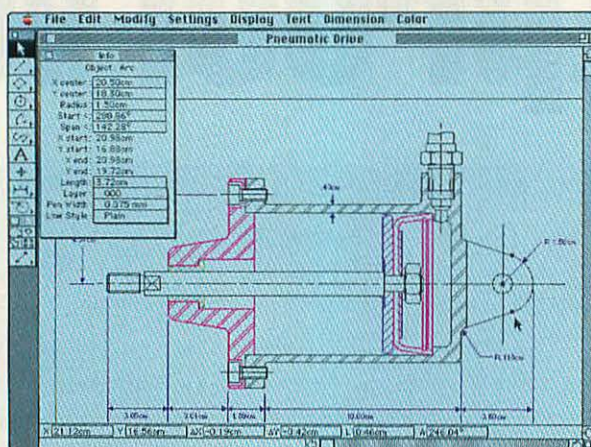
EMAC
More for your Mac

EMAC, the EMAC logo, Metro, SCSI Sentry, and "More for your Mac" are trademarks of Everex Systems, Inc. Other brand names and product names are trademarks or registered trademarks of their respective companies. EMAC, a division of Everex Systems, Inc., 48431 Milmont Drive, Fremont, CA 94538

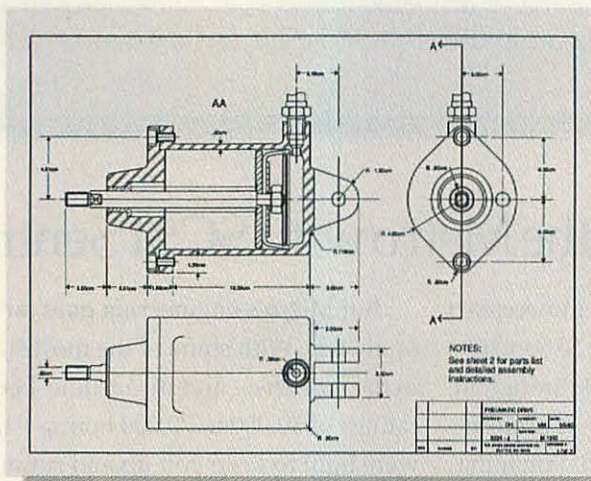
Dealers Circle 110 on Reader Service Card
End Users Circle 455 on Reader Service Card



DOODLE.



DESIGN.



DONE.

U.S. \$595



Introducing Generic CADD™—real CADD with a true Macintosh® interface. From first inspiration to final production drawing, it's the one program that you can use in every phase of your design.

Generic CADD combines drawing ease, drafting precision, and Generic Software's renowned technical support—all for hundreds of dollars less than the competition.

For a free brochure and the name of your nearest dealer, call us at 1-800-228-3601.

It's CADD that's worth a closer look.

Generic
SOFTWARE
An Autodesk Company

**IT DOESN'T GET
ANY EASIER.**

© 1990 Generic Software, Inc., 11911 North Creek Parkway South, Bothell, WA 98011. FAX 206-483-6969. Macintosh is a registered trademark of Apple Computer, Inc. Generic CADD and Generic Software are trademarks of Generic Software, Inc.

Circle 157 on reader service card



Getting Started with Desktop Video

HOW TO PUT YOUR MAC ON TV—CHEAPLY

W

BY JIM HEID

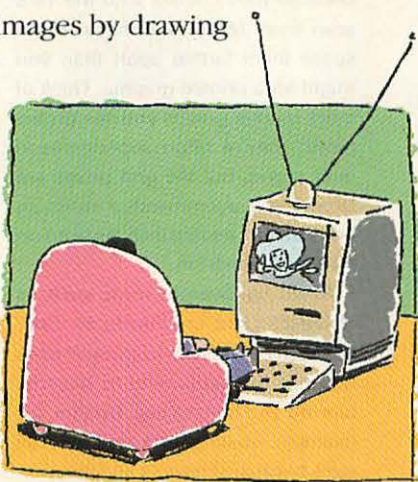
hat looks like a television, but isn't? A computer screen. On the surface, the Mac's screen seems similar to a television set's—it uses a video tube that you definitely do not want to break, and it creates images by drawing

hundreds of narrow horizontal lines.

But beyond that, the Mac and a TV set take very different approaches to creating images. Normally, you don't need to worry about these differences. Your Mac and your TV lead separate lives, with little in common between them.

But then the day comes when, for reasons I'll describe shortly, you would like to videotape what you see on the Mac's screen. It's then that the differences between Macintosh video and *broadcast video* become critical.

This month, I'll explain some of the technical differences between Mac video and broadcast video, and I'll let you in on one of the best-kept secrets in the Macintosh world—a free Apple utility that lets you attach a standard Macintosh II Video Card directly to a video recorder using a simple cable, which you can make yourself or have a TV technician make for you. The results aren't 100 percent *broadcast quality*, as they say in TV, but they're quite close. In any case, it's a wonderful way to try your hand at videotaping Mac images and to learn a bit about how television works. (For details on Mac hardware products that produce broadcast-quality video, see "Prime-Time Video" in this issue.)



WARD SCHUMAKER

Why Mac TV?

Before we look at the hows and whats of recording Mac screens, it might be useful to spotlight the whys. Here are some project ideas to stimulate the TV producer within you:

Record a presentation Perhaps you'd like your employees in the field to see that presentation you gave to the home office. Create your visuals using a presentation program such as Microsoft PowerPoint or Aldus Persuasion, and then use the program's slideshow feature to advance through the visuals while videotaping them. Because you're recording directly from the Mac, you'll get better quality than

if you just aimed a video camera at the screen and podium. You can also record your speech by attaching a microphone or public address system to the video recorder. This technique can also help you fine-tune your presentation—and your presentation skills.

Record animation As we saw in last September's "Getting Started with Animation," products like MacroMind Director and Apple's HyperCard allow artists to create impressive computer animations. If you're one of these digital Disneys, you can videotape your efforts and not have to fire up a Mac to show them off. Other pluses: you can see your work on a larger screen and add a sound track. And you can create a longer animation than would otherwise fit in memory or on disk by creating it in several sections and then videotaping each section in turn, pausing the video recorder while loading each one.

Create a training video Perhaps your company uses custom-developed Macintosh software, or maybe you'd like to educate new employees on the fine points of your electronic-mail system or network file server. By videotaping your own software or system in action, you can create a custom training video that reflects exactly how your company or department uses the Macintosh.

Record Macintosh demonstrations A school in Los Angeles videotapes the HyperCard stacks that students create so they can show their efforts to parents. Indeed, videotaping (continues)

the Mac is an ideal way to show someone else what it can do. Just ask Apple, Microsoft, Adobe Systems, and Letraset. They're among the firms that have produced video demonstrations of their products in action.

Create a promotional video By mixing videotaped footage of live action with static or animated visuals created on the Mac, you can create a promotional video that can run in stores or be sent to prospective customers. Some advice: if you don't have any TV production experience, you might want to consult with someone who does. An amateurish promotional video may do more harm than good.

Create titles for home videos Let's be honest—this is really what we want to do with our Macs and video recorders, isn't it? And why not? Titles can lend a finishing touch to a home video, and they can be fun. Some video cameras have built-in titling features, but they're often hard to use and their typefaces aren't nearly as attractive as the Mac's. One catch: you can't superimpose a Mac-generated title over a videotaped image without specialized hardware, which I'll describe shortly.

Set up an emergency monitor If you attach a Mac to a video recorder that's attached to a TV set, you can use the TV as a Mac monitor. The results aren't great—you wouldn't want to use a TV as a monitor for very long—but they might be good enough to get you through an emergency if your main monitor breaks.

TV Technicalities

So there are several good reasons to put the Mac on TV. But why can't you just aim a video camera at the Mac's screen?

Actually, you can, but you may be disappointed by the results. For one thing, you're likely to pick up glare or reflections from the screen. For another, your videotape will have a fuzzy, out-of-focus appearance, even if you're extremely careful about positioning the camera. Worst of all, because of technical differences between Mac video and TV, your videotape will have a horizontal line running through it every few seconds. The bottom line: to get a clean recording of the Mac's screen, you need to attach the Mac directly to a video recorder.

DESIGNING FOR TELEVISION

To learn about the unique requirements of television graphic design, I talked with Anne Healy, graphic artist for NBC's "Late Night with David Letterman." Her advice: Keep it simple. "On television, everything looks soft," she says. "There's no real accuracy because of the [limited] resolution."

Some specific tips:

- Avoid thin lines. Lines that are one scan line wide will flicker badly, and even lines that are two scan lines wide tend to break up. Use horizontal lines that are an even number of pixels (2, 4, 6, 8) high.
- Avoid tightly spaced parallel lines, small boxes, and tight concentric circles. All three are prone to flicker because they conflict with the TV's scan lines. Make them heavier and space them farther apart than you might for a printed graphic. Think of stock market graphs you see on the news: they're often superimposed over a grid, but the grid boxes are large. Healy recommends a minimum box size of 1 square inch, as seen on a 19-inch television.
- Avoid lightweight fonts such as Helvetica Light or Univers 45. Serif typefaces are also risky in small sizes because the serifs tend to become blurred and hard to see. Bodoni, for example, doesn't work well in small sizes because the serifs and thin portions of characters are too thin. Times and Caslon don't always work well, either. Century Schoolbook is better,

because its thins aren't very thin.

- Don't space characters too tightly. Avoid excessively close kerning. The edges of characters "bloom" when televised, so the characters appear closer together than they really are. To compensate, space characters so that they look a bit too loose on the Mac's monitor.
- Choose colors carefully. As a general rule, combine colors that are very different, like a light blue and a dark red, not a medium red and a medium blue. "Once I used a full range of pastel colors," Healy says, "and they all ended up looking the same." Also, avoid colors that are too hot, like hot pink or lemon yellow. If you want yellow, use a more golden yellow. If a color is too hot, it can bleed past its borders or appear to vibrate.
- For titles that will not be superimposed over an image, use a black background and white or colored text. Black or colored text on a white background is rarely used in television—for the same reason that it's rarely used in presentation graphics: an all-white background tends to be too glaring and harsh.
- For titles that will be superimposed over an image, keep the text simple—use a font such as Univers 65 or Helvetica Medium—and choose a color that will allow the text to be visible over the background. Don't use white text, for example, if the background is a snow-covered ski slope.

To unite a Mac and video recorder, you need to attach the Mac video board's video-output connector to the video recorder's video-input connector. You also need to be sure that the Mac is sending a signal that the video recorder can receive. And that's when you encounter the differences between Mac video and TV.

The first of these differences concerns those horizontal *scan lines* that form video images. On all video tubes, these lines are formed by an

electron gun (or, with most color monitors, three electron guns) within the video tube. The gun fires a stream of electrons at the tube's inner surface, causing its phosphor coating to glow briefly.

On a Mac II with Apple's standard Macintosh II Video Card, there are 480 horizontal scan lines, and they're painted one at a time, from left to right, from the top of the screen to the bottom. One complete set of scan
(continues)

Four good reasons you should be using Scan Reader™ as your OCR program

1 Flexibility...

With the new CTA SCANREADER™ program you can automatically enter printed information into your word-processor, data-base, or spreadsheet programs. Forms, catalogs, manuscripts, brochures, technical manuals, documents can be fed into your Macintosh many times faster than manual keying. Requiring only 1 megabyte of memory SCANREADER™ can read entire pages or just the information you need in background mode, fast and accurately.

3 Reliability...

Whatever the source of material -text or numeric tables- SCANREADER™ offers a level of accuracy you can count on. Direct control of Macintosh scanners allows you to control the quality of every scan-read, everything from magazine articles to daily correspondence!

4 Best value for your money... \$495!

CTA, the developers of TEXTPERT, now offer SCANREADER™ at a price within the reach of even the smallest company \$495! No more long hours of manual keyboard entry. Make

big gains in your company's productivity with SCANREADER™... enter information into your computer the fast, efficient way. Days of work can be handled in a matter of hours... with BIG MONEY savings for your company.

2 Easy to use...

Designed to make your workload lighter, SCANREADER™ provides the modern answer to office document management. SCANREADER™ makes easy work of entering masses of printed information into your computer. Just SCAN and READ! Needs no training it's automatic. Nothing could be simpler!



CTA, inc.
747 Third Ave., 3rd floor
New York, NY 10017
Tel: 1-212-935 2280
Fax: 1-212-935 2272
Applelink: D2372

CTA
Roger de Llúria, 50 entlo.
08009 Barcelona (Spain)
Tel. (93) 318 47 37
Fax. (93) 302 51 10



GE Rents
Computers for Business



Fight Office Fires With Computer Rental From GE.



Apple, the Apple logo, and Macintosh are registered trademarks of Apple Computer, Inc.

Another hot deadline's raging. You'll never survive it without more Apple® Macintosh® computers. Thank goodness there's a one-call rescue service: GE Rents, always ready to rush more Apple computers and printers to the scene. For a day, week, month or a year. At economical rates that won't burn your budget. With overnight delivery—even same day in some areas. And renting is so smart, maybe soon you'll be the one setting the deadlines. Feeling the heat? Call GE Rents: The idea that's revolutionizing the way business uses computers.

CALL 1-800-GE-RENTS

Copyright 1990, GE Rents

Circle 195 on reader service card

lines is a *frame*. The Macintosh II Video Card repaints the entire frame 66.67 times per second (which translates into a *frame rate* of 66.67Hz).

By contrast, American television uses 512 horizontal scan lines, painted in a very different manner. Instead of painting one frame's worth of scan lines from top to bottom, a TV set paints them in two separate passes, or *fields*. First, all the odd-numbered lines are scanned, and then all the even-numbered lines are scanned. Each field is painted 30 times per second, giving broadcast video a frame rate of 30Hz. Thanks to *persistence of vision*—the same phenomenon that makes movies appear to move—we see the two fields as one image. This two-fields-per-frame approach is called *interlaced video*. The Mac's approach of painting all the scan lines in one pass is called *noninterlaced video*.

Mac video and TV also handle color differently. In the Mac, the signals for red, green, and blue—the primary additive colors from which all colors are created—each travel on a

separate wire. Other wires carry synchronization, or *sync*, signals. This approach is called *RGB video*.

In the TV world, the red, green, and blue signals are merged with the sync signals into a *composite* signal that's technically simpler but lacks the sharpness and clarity of RGB video. The rules that describe the format of a composite broadcast video signal were developed about 30 years ago by the National Television System Committee, or NTSC. Broadcast video is often referred to as *NTSC video*, or by the name of the standard itself, *RS170*.

Lowering Your Standards

So in many ways, an NTSC signal is technically inferior to a color Mac's video signal. That's to be expected, given the less-demanding nature of television—a TV image doesn't have to be sharp enough to display small text that's legible at arm's length. To record a video signal directly from the Mac, we need, in essence, to tell the Mac to lower its standards.

Hardware add-ons such as Mass

Microsystems' ColorSpace Ili (for the Mac II family) and ColorSpace Plus/SE (for the Plus and SE) do this by outputting a true NTSC video signal. Often such products also include a *genlocking* feature that lets you superimpose a Mac video image over an existing video image. When you see an announcer's name appear at the bottom of the screen as he or she speaks, you're seeing genlocking in action.

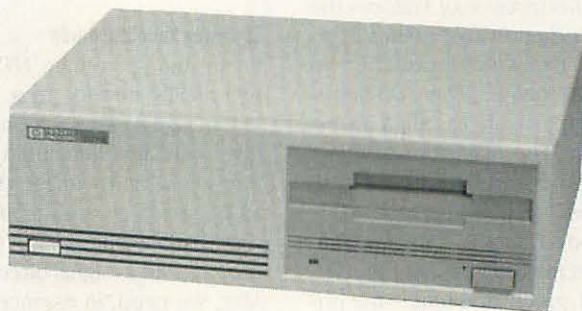
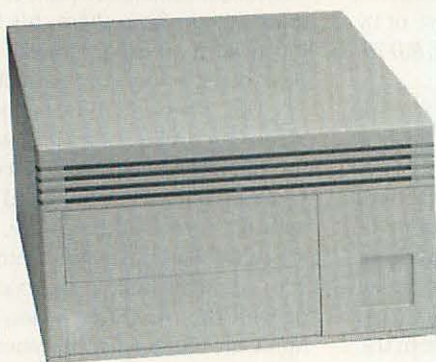
But specialized video hardware starts at about a thousand dollars and goes way up from there. It's hard to justify such an expenditure if you do desktop video only occasionally.

That's where the Macintosh II Video Card Utility comes in. If you have the original Macintosh II Video Card, you can get reasonably good results with no additional hardware, except the cable. Alas, the utility doesn't work with the Ili's built-in video circuitry or with the three new video boards Apple unveiled earlier this year. Those boards, however, can produce NTSC video directly using a special adapter (*continues*)

Imagine Losing Everything In Your Mac.

Hard Drives With a Difference

PROTECTED BY FIVE-YEAR WARRANTY*



330MB \$2800

660MB \$3475

Good news, bad news

First the good news: When it comes to performance and reliability, Hewlett-Packard disk drives are unmatched. And now, they're available for your Macintosh system, complete with software, cabling and a five-year warranty.

The bad news? With formatted capacities of 330 and 660 Mbytes, they're not for everyone.

A fresh perspective

At Cranel, we don't sell 20 Mbyte drives. We sell drives with capacities up to 1 Gigabyte. Drives that have proven themselves in the most demanding applications, including engineering and graphics. Drives that help unlock the potential of your Macintosh system. You expect a lot from your Mac and we turn your expectations into reality.

System Specifications

Dimensions	5.75" h. x 13" w. x 9.25" d.
Transfer rate (async SCSI)	1.5 Mbytes/s
Track-to-track seek time	3.5 ms
Average seek time	16.5 ms
Maximum seek time	32 ms

See us about optical, too

As an authorized Hewlett-Packard representative, we can also meet your need for rewritable optical disk drives. With a capacity of 650 Mbytes per disk, an average access time of 107 ms, and a sustained read transfer rate of 680 Kbytes per second, optical drives provide economical online storage or backup.

We make it easy to do business

At Cranel, we know how to do business with businesses – both large and small.

Our toll-free number puts you in touch with a knowledgeable sales representative who can give you more information on the hard drive with such an outstanding record of performance it carries the longest warranty in the industry.

800-288-3475

CRANEL
INCORPORATED

510F East Wilson Bridge Road
Worthington, OH 43085-2373
(614) 433-0045
Fax: (614) 433-0073

"The Peripheral People"

100 Otis St., Suite 7
Northborough, MA 01532-2416
(508) 393-2880
Fax: (508) 393-5054

*Five-year warranty applies only to hard drives. Optical drives are covered by one-year warranty.

GETTING STARTED HOW TO

cable (see "Power at a Price" and *State of the Mac*, *Macworld*, May 1990).

What It Does—and Doesn't—Do

The Apple video utility relies on the Macintosh II Video Card's ability to be reprogrammed to put out a different kind of video signal. The utility is a start-up document (an INIT) that reprograms the video board to output a signal that's very close to the NTSC standard. The signal isn't completely NTSC-compatible, says Jack Palevich, the utility's creator, because "the video card isn't infinitely programmable." Because he couldn't completely reprogram the board, Palevich was forced to "round off" certain aspects of the modified video signal and, as a result, some video equipment may not be able to receive the signal perfectly. I had no problems tuning in the Mac's signal on a Sony VCR. If you have problems, you may be able to resolve them by adjusting the video recorder's fine-tuning controls.

The utility supports each of the Mac II Video Card's modes (2, 4, 16,

or 256 colors), but in black and white only. So, you can record gray-scale images or use the fade-in and -out effects of programs like MacroMind Director, but you can't record in color.

Perhaps the most serious problem with recording Mac screens is that any horizontal lines that are 1 pixel wide—like the lines in the title bar of a Mac window—flicker like a 1930s cartoon. This distracting flicker occurs because of the NTSC standard's interlaced approach—a horizontal line that's one scan line wide will appear in only one of the two fields that make up each frame. Thus, the line flashes on and off 30 times per second.

The Apple video utility fixes this by providing a *flicker filter*, a software routine in which each scan line is evaluated and averaged with lines adjacent to it. If that sounds similar to the Apple Convolution feature built into Apple's latest video boards (and described in "Power at a Price," May 1990), it is. The Apple Convolution routine was based on the flicker filter in this free and humble utility.

But filtering flicker isn't free—it uses 48K of memory and slows the Mac by 20 to 40 percent. Pull-down menus become ooze-down menus. Animations run in slow motion, although you can often adjust for that by playing the animation back faster. (This performance penalty doesn't apply to Apple's new video boards.)

Using the Utility

The Apple video utility includes several pages of clearly written documentation, so I won't describe how to get it up and running here. I will, however, describe what you need to use it and provide some tips gleaned from my own experiments. The utility itself is available for downloading from CompuServe and America Online. It should also be available through user groups. Keep in mind that the utility is unsupported, though. Apple, your local dealer, and *Macworld* are not responsible for, or obligated to help you with, any problems you have.

Besides the Mac II Video Card, you
(continues)



You'll get your data back fast with SUM II.™ New SUM II recovers crashed hard disks and accidentally thrown away files so effectively, *MacWEEK* magazine calls it "the best set of utilities available for file and disk recovery."*

SUM II protects data, speeds up hard disks, and even includes a complete backup program. It's the

best-selling, highest-rated data protection and recovery program for the Macintosh.™ Imagine what it can do for you.

Get SUM II today! See your dealer or call (800) 228-4122 Ext. 688G for information.



Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014. (408) 253-9600.

*Steve Costa, *MacWEEK*, 10/3/89. ***MacUser* 1989: Editor's Choice, 5 Mice Rating, and Eddy Award for Best Utility. *Macworld's* 1990 Reader's World Class Award. *Publish's* 1989 Reader's Choice Award. Best seller through National Distributors: Ingram Micro D, Softset, Kenfil. SUM is a trademark of Symantec Corporation.

© 1990 Symantec Corporation

SYMANTEC.

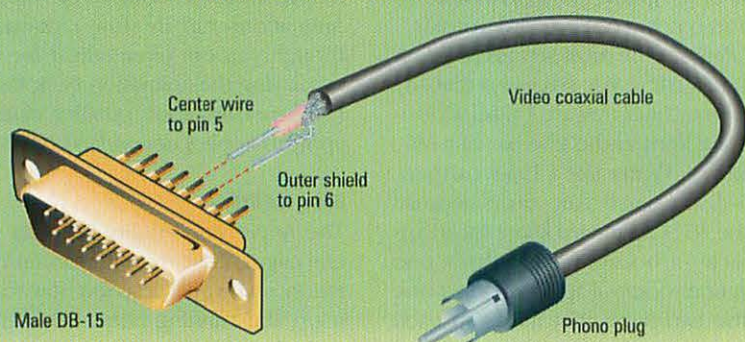
The #1 Data Protection
and Recovery Program

SUM II

Crashed Disk and File Recovery, Backup, Optimization, and Security

Circle 237 on reader service card.

MAKING THE CONNECTION



To attach the Macintosh II Video Card to a video recorder, construct a cable as shown here. The Macintosh end of the cable requires a male DB-15 connector. Many video recorders use a female RCA phono plug for their video inputs; in such cases, the recorder end of the cable should use a male RCA phono plug. You can use a shielded audio cable as a starting point for your cable, cutting the plug from one end and attaching the wires to the DB-15. The center wire of the cable attaches to pin 5, while the outer shield wire attaches to pin 6. Caution: You can damage your Macintosh and your video equipment by constructing the cable improperly. Consider having a video technician construct the cable for you.

need System 6.0.3 or a later version, along with the 32-Bit QuickDraw and Monitors files that accompany those versions. You'll also need to make a simple cable (see "Making the Connection").

You may need to flick a switch on your video recorder to tell it that video is coming from the video-input connector, not the recorder's built-in TV tuner. On my Sony VCR, for example, I move a switch labeled Input Select from the Tuner to the Line position. Check your video recorder's manual for details.

To record sound coming from the Mac, attach its audio-output jack to the video recorder's audio-input jack. (For details on connecting the Mac's sound jack to other audio devices, see "Getting Started with Digital Sound," *Macworld*, November 1989.) You can also record sound from a different source—such as a public-address system or stereo—by connecting the sound source's line-output jack to your video recorder's line-input jack.

To create titles for a video, consider using a paint program (I used PixelPaint 2.0) that lets you hide the

menu bar and its tool palettes. Create the title using the program's text-editing tools, and then hide its menu bar and tool palettes before recording the title. Because of a television industry practice called *overscan*, in which the image projected onto a television's video tube is larger than will fit, the outer edges of the Mac's screen won't appear on the television or videotape (see "Video Boundaries"). So it's best to design the title to occupy the center of the Mac's display—although you still may need to adjust the position of the text after you've connected the Mac to the VCR and TV.

Most commercial video products compensate for overscan. Also, when you activate the flicker filter in the free Apple video utility, the utility shrinks the Mac II's screen so it has the same dimensions as a compact Mac's—512 horizontal pixels by 342 vertical pixels. This allows you to videotape a full Mac screen, which is especially useful if you're taping a training video or HyperCard stack.

Overscan was born in television's early days, when the image on a picture tube would gradually shrink as

the tube aged. Today's picture tubes don't suffer from this flaw, but overscan remains, partly to accommodate the elderly televisions still among us and partly because television manufacturers would rather fill an entire screen than have a black border around its image. On the other hand, computer monitors *underscan*—they project an image smaller than the tube's surface in order to show every precious pixel.

And that brings up the issue of designing titles for television, whose technical limitations impose some restrictions on graphic designers. You'll find some tips from a professional in "Designing for Television."

Signing Off

If you try Apple's utility, drop me a line and let me know how it worked for you. Write to me in care of *Macworld*, or send electronic mail to 76174,556 on CompuServe, or to JimHeid on America Online.

Thanks to specialized video hardware, the Mac is playing a role in professional video production. Thanks to Apple's free utility, the Mac can play a role in the amateur video world, too. We video buffs owe thanks to Jack Palevich for developing the utility and to Apple for making it available.



Video Boundaries

Of the Mac's standard 480 horizontal lines, only about 360 appear on a TV screen. To compensate for this, avoid using the outer 15 percent or so (about an inch and a half) of the screen.

See *Where to Buy* for contact information.

Jim Heid is a Macworld contributing editor who each month focuses on a different aspect of Mac fundamentals. His latest book, coauthored with Peter Norton, is Inside the Apple Macintosh (Brady Books, 1989).

PostScript Power To The People!

The QMS-PS® 410 Printer. Developed by the greatest minds in the industry. . . Yours.

Before engineering the QMS-PS 410, we performed one very important task. We listened. Then we took everything we heard, added a few surprises, and built a revolutionary laser printer with a suggested retail price of just \$2795!

You said make it Adobe® PostScript®. So we did. And now you can enjoy the design flexibility only PostScript offers as well as 45 resident typefaces and thousands of PostScript software applications.

You said make it reliable. So we used the Canon® LX print engine manufactured by the undisputed world leader in high-quality, easy-maintenance print engines.

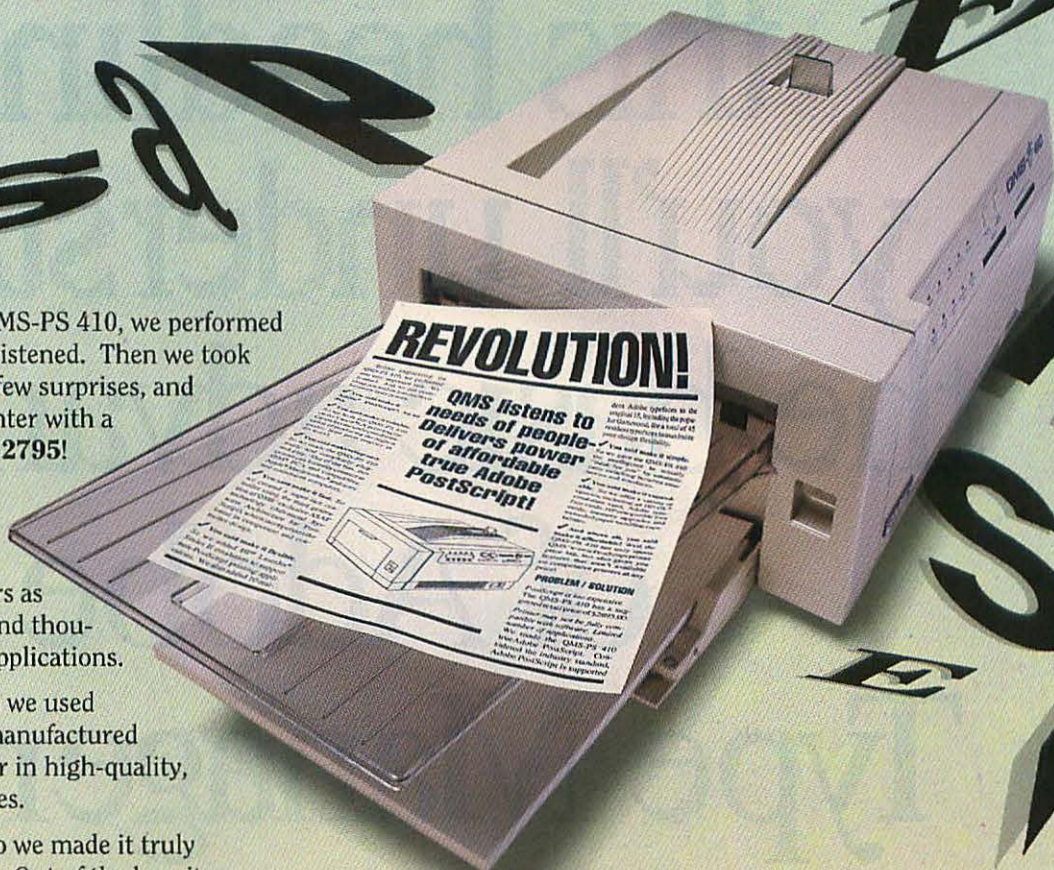
You said make setup easy. So we made it truly and completely plug-and-play. Out of the box, it connects to IBM® PC's and compatibles, Apple® Macintoshes® and mini and mainframe computers.

You said make it flexible. So we added HP® LaserJet® Series II emulation to support non-PostScript printing applications.

You said make it simple. So we gave the QMS-PS 410 the intelligence to actually "think for you" by automatically switching between emulations and interfaces! This printer has ESP (Emulation Sensing Processor), which interprets incoming data and *automatically* chooses the appropriate printer language. And you can send data *simultaneously* to its AppleTalk®, serial and parallel interfaces! There's no need to change switch settings or send complicated software commands.

You said make it fast. So we created a super-fast controller with a 68020 processor and third generation QMS® ASAP™ technology (Advanced Systems Architecture for PostScript), which incorporates the latest in component and controller design.

You said make it expandable. So we made a variety of options available, including an HP-GL® emulation card, Adobe typeface cards, HP compatible font cards, memory upgrades and extended paper handling capabilities.



Call Now and Let the QMS-PS 410 Liberate You!

1-800-523-2696

You see, listening to you gave us the insight to develop a printer that offers real world solutions to real world problems. And the QMS-PS 410 delivers PostScript power to the people by giving you more solutions than any other printer on the market. Affordable. Reliable. Flexible. Solutions that set you free!



POSTSCRIPT®

QMS™

The following are trademarks or registered trademarks of their respective companies: QMS, the QMS logo, QMS-PS and ASAP of QMS, Incorporated. IBM of International Business Machine, Incorporated. Adobe, PostScript and the Adobe PostScript logo of Adobe Systems, Incorporated. Canon of Canon USA, Incorporated. Apple, AppleTalk and Macintosh of Apple Computer, Incorporated. HP, HP-GL and LaserJet of Hewlett-Packard Company. Centronics of Centronics Data Computer, Incorporated.

Circle 104 on reader service card

Before you finish this headline, you'll understand the basic advantage of Adobe Type Manager 2.0.

We're glad we had a chance to clear things up. Because that's exactly what Adobe Type Manager™ software does best.

And now Adobe Type Manager 2.0 does it even better.

Because, while it still clears up the jagged text on your Macintosh® screen and out of your Apple ImageWriter® or Hewlett-Packard DeskWriter™, this new version does it more than twice as fast as its predecessor.

But in addition to being faster to use, it's also easier to install. Simply drag

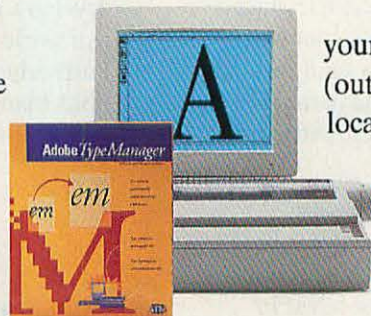
FASTER! EASIER!

Adobe Type Manager 2.0 and all its fonts into your system folder and you'll never have to think about them again.

But you should think about this: Adobe Type Manager 2.0 software is retail-priced at just \$99*. Which means you don't need a high-cost printing system to produce high-quality text.

So call 1-800-344-8335 for the name of your nearest Adobe Authorized Dealer (outside the U.S.A. and Canada, call your local distributor).

And do it before you start another headline.



ADOBE®

This ad's headline was created in QuarkXpress™ 2.1 with Adobe Type Manager (excluding the first three lines) and output on an ImageWriter at 72 point size.



POSTSCRIPT®
Software From Adobe

Look for this symbol on computers, printers and other products that include PostScript software from Adobe Systems. It's your guarantee of quality and compatibility.

The Adobe logo and the PostScript logo are trademarks of Adobe Systems Incorporated, registered in the U.S.A. Adobe Type Manager is a trademark of Adobe Systems Incorporated. ImageWriter and Macintosh are registered trademarks of Apple Computer, Inc. DeskWriter is a trademark of Hewlett-Packard Co. QuarkXpress is a trademark of Quark, Inc. © 1990 Adobe Systems Incorporated. All rights reserved. *Valid in U.S.A. and Canada.

Insights on Canvas 2.1

DRAWING TIPS FOR CANVAS DABBLERS

BY ERFERT FENTON

Deneba Software's Canvas, like fine wines, violins, and Sean Connery, just keeps getting better with age. Version 2.1 adds such niceties as a preview window for aligning objects, improved bezier curves, dashed lines, a color-separation

utility, and—of all things—a spelling checker. The following tips should make you a more proficient illustrator the next time you face a blank Canvas screen. Thanks to Rebecca Huba, Brooks Bell, Carmine Delligatti, Fawad Khan, and David Rumfelt for their help.

Selective Changes

Let's say you've just spent 40 hours drawing a detailed floor plan of the Palace of Versailles in Canvas 2.1. You print it out and discover, to your dismay, that the pen lines you used for the walls look a mite thin; you wish that you'd used a 2-point pen line instead of a 1-point line. The fact that you waited 40 hours before printing a proof does not speak well of your IQ, but fortunately Canvas 2.1 provides the means to rectify just such a cretinous oversight.

To change all the 1-point pen lines in your drawing to 2-point lines (or any other custom line width you specify), follow the steps below. This tip will allow you to change other drawing attributes as well, such as colors, fill patterns, or pen patterns.

1. Hold down the Option key while you choose Select All from the Edit menu. Release the Option key.

2. Go to the Tool Box and select

the drawing attribute you want to change. In this example, you'd go to the Pen Manager and select the 1-point pen size. Canvas will select all objects that were drawn with the 1-point pen.

3. Next select the change you want to implement—in this case the 2-point pen size—in the Pen Manager dialog box. The program will change all 1-point pen lines to 2-point lines.

Of course, this method will change all the 1-point pen lines in the drawing. If your drawing of Versailles con-

tains some details that *should* be drawn with the 1-point pen, you'll have to change them back by hand.

AutoTrace with Finesse

The AutoTrace To command converts a bitmapped image into a set of polygons, which can be edited like any other object-oriented graphic. But AutoTrace To may not capture enough detail for your liking. Not to worry. You can instruct it to trace with more precision by following these simple steps.

1. With the lasso, marquee, or arrow tool, select the bitmapped image (or portion thereof) you want to trace.

2. Choose Object (Object menu). In the dialog box that appears, change the resolution from 72 to 150 or 300 dots per inch and click OK.

3. Select AutoTrace To from the Effects menu.

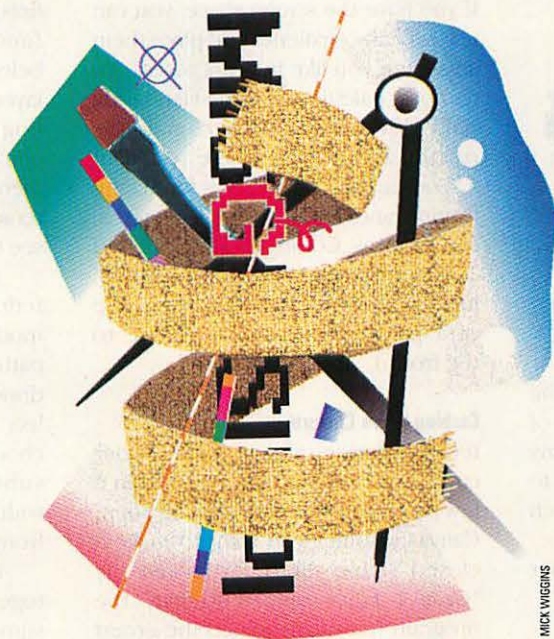
4. Go into the living room, settle into your favorite chair, and read *War and Peace*. If you're tracing a detailed image, the AutoTrace procedure could take quite a while. But the improvement should be worth the wait; compare the traced images in "A Trace More Detail." (Note: You can cut the tracing time somewhat if you select the AutoTrace To command's Smooth Polygon option, rather than Polygon. The Smooth Polygon option captures fewer vertices when tracing an image.)

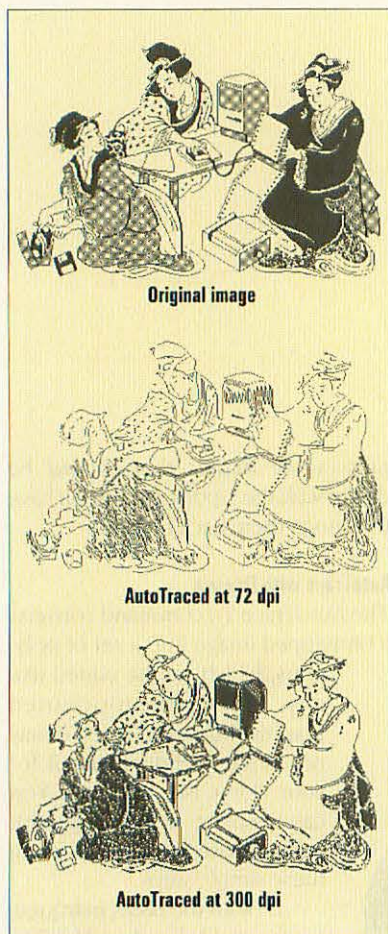
MICK WIGGINS

Let's say you've autotraced an image at 300 dpi, as suggested in the last tip. (continues)

Editing Polygons

Let's say you've autotraced an image at 300 dpi, as suggested in the last tip. (continues)





A Trace More Detail

To autotrace with greater precision set a higher resolution in the Object Manager dialog box.

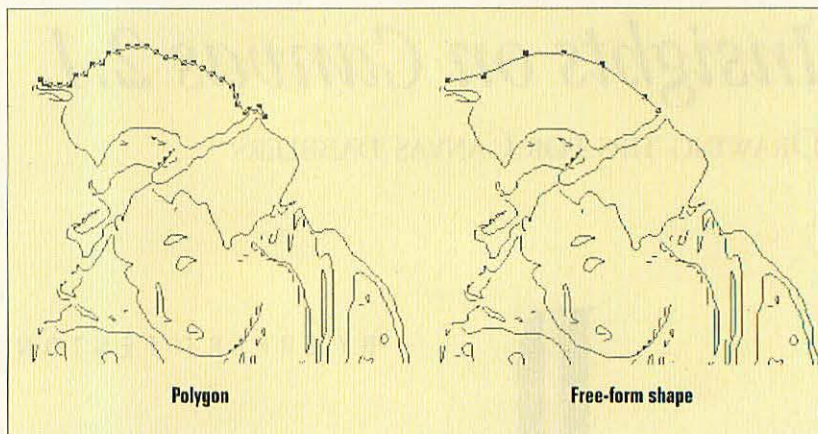
A polygon, as you can see from the figure entitled "A Thousand Points of Line" can be made up of a great many vertices. Grabbing a single point to edit the polygon can be tricky, even when the image is magnified.

Here's how to reduce the number of editing points in a polygon.

1. Select the polygon.
2. Choose Object from the Object menu. In the Object Manager dialog box, the icon indicating Object Type will be a polygon. Change it to the free-form shape and click OK. When you return to the shape, it will have half the number of editing points it had as a polygon.

3. With the shape selected, choose Edit Polygon from the Object menu or double-click on the selection to enter the editing mode.

(Note: Removing too many points in a polygon can distort its shape. If yours ends up drastically altered,



A Thousand Points of Line

Polygon precision is well and good, but you might find it hard to edit the seething tangle of points that make up some smooth polygons. To reduce the number of points, change the polygon to a free-form shape.

immediately select Undo from the Edit menu to restore the original.

Permanent Palettes

If you have the screen space, you can tear off Canvas palettes and place them anywhere you like for easy access. To tear off a palette, select the Hand tool, hold down the spacebar, grab the palette, and place it where you want it. You can tear off palettes for Magnification and Reduction, Fill Patterns, Pen Patterns, Colors, Line Widths, and Transfer Modes. (If palettes overlap, just click on the gray bar at the top of a palette to bring that palette to the front.)

Curbing Curve Closure

If you're drawing along with the bezier curve tool and place a point within a few pixels of the curve's starting point, Canvas assumes you want to make a closed shape. Before you can say "Gaaa! I didn't want to do that!" the program has neatly joined the errant point to the starting point, making your would-be curve into a closed shape. To curtail this potentially annoying feature, hold down the Tab key as you draw. Even if a point strays dangerously close to the starting point, the curve will remain a curve.

Quicker on the Redraw

If the drawing you're working on contains a lot of complex objects, you can waste a good deal of time waiting for the image to redraw after you make a change. Canvas offers several ways to cut down on redraw time.

One way to speed up redraw is to take advantage of Canvas's Layer Manager. Create parts of your drawing in different layers of Canvas. When you've finished a section, turn off that layer (uncheck the Layer Manager box labeled Visible). The graphics in that layer won't show up on screen and bog down the redraw rate. When you've finished all the drawing elements—or need to see how they interact—turn all the layers back on to see the entire drawing.

Another way to avoid unnecessary redraw time is to work in wire-frame mode, which eliminates colors, fills, patterns, and pen widths during redraw. To enter wire-frame mode, select Display from the Layout menu, choose Wire Frame from the Display submenu. To view shading, line widths, and so on, select QuickDraw from the Display submenu.

If you want to turn off redraw altogether, press ⌘- (period). To resume redraw, press ⌘-K.

Paste and Trace

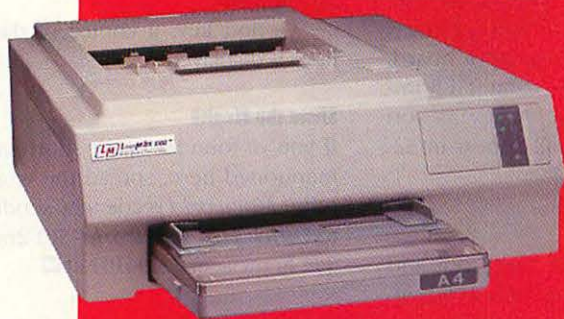
Here's how to trace a scanned image:

1. Open the scanned image in Canvas 2.1. It will automatically appear in Layer #1.
2. Open the Layer Manager and click the New Layer button. Canvas 2.1 will, predictably enough, name the new layer Layer #2.
3. In the Layer Manager's list of drawing layers, select Layer #1 and check the Grayed option.
4. Now, select Layer #2 and click (continues)

FOR YOUR MACINTOSH II

The Pen is Mightier Than the Sword

But, the LaserMAX is Mightier Than the Pen;



The Truly Mighty Have a LaserMAX 1000

Macintosh publishing and graphics professionals choose your weapon! Arm yourself with the powerful LaserMAX 1000 Personal Typesetter and you'll be able to challenge even the most expensive phototypesetters on the following publishing fronts: resolution, typeface flexibility, convenience, and cost savings.

With Personal Typesetting by LaserMAX, you'll not only challenge the phototypesetting market—you'll be able to claim a decisive victory. Personal Typesetting bridges the gap between ordinary laser printing and traditional typesetting by providing you with high-quality resolution, typeface diversity—and desktop convenience.

1000 x 1000 Resolution

The LaserMAX 1000 Personal Typesetter works with any Macintosh II to give you precise 1000 x 1000 TurboRes resolution. TurboRes is LaserMAX's proprietary printer enhancement technology that shatters previous resolution restrictions. Combining a LaserMAX MX6 printer controller with your existing Apple LaserWriter, gives you crisp 800 x 800 TurboRes output. Either way, the result is camera-ready copy on plain paper.

135 Typefaces

In addition to enhanced resolution, LaserMAX has expanded their typeface library to include 135 classic typefaces. With a collection this diverse, you'll be able to experiment with literally hundreds of different typefaces without any added expense because LaserMAX's typeface collection (in Type 1 format) comes standard with both the LaserMAX 1000 Personal Typesetter and the MX6 controllers.

Personal Typesetting

Personal Typesetting by LaserMAX allows you to retain total control over final output. So if you want crisp, accurate, typeset-quality text and line-art right from your desktop whenever you want it—CALL US NOW!

For more information about LaserMAX Personal Typesetting, call us at (612) 944-9696, Dept. 113.



First in Personal Typesetting

7150 Shady Oak Road Eden Prairie, MN 55344
TEL: (612) 944-9696 FAX: (612) 944-9151



The Layered Look

Canvas allows you to place a scanned image in one drawing layer and trace it in another.

OK. You will return to the drawing window, with Layer #2 as the active drawing layer. The scanned image in Layer #1 appears in gray, allowing you to see the black lines you'll use when tracing (see "The Layered Look").

5. Set the fill pattern to None.
6. Choose Preferences from the File menu and check Retain Selected Tool After Drawing.

You can now use the pen or the Freeform tool to trace the grayed image. Use the Layer Manager to delete Layer #1 before printing, or use the Print Layer command to specify that it shouldn't be printed.

A Bit More Color

If you have a color monitor, you can place an 8-bit TIFF file into a Canvas document. With a 32-bit color board, you can also import 32-bit TIFF images. Hold down the \mathbb{H} key as you open a TIFF file; it will appear in 32-bit instead of 8-bit color.

Shortcuts

When you select the Text tool and hold down the mouse button, a pop-up menu lists styles and justification options. You can quickly access other text options as you perform the same operations while holding down the following keys:

\mathbb{H} key: a list of fonts appears

Shift key: a list of sizes appears
 \mathbb{H} and Option keys together: a font list appears with each font name displayed in the font itself (for example *Times* is in the *Times* font)

When you select the Line Manager (the long box with a line in it) and hold down the mouse button, a selection of line styles appears. The following shortcuts allow you to select other line attributes:

Shift key: an array of line terminators appears

Option key: a choice of dashed lines is displayed

Share the Wealth

If you've found a tip or shortcut not mentioned here, spread the word to other *Macworld* readers by sending it to *Quick Tips*, *Macworld*, 501 2nd St., San Francisco, CA 94107. \square

See *Where to Buy* for contact information.

Erfert Fenton is a Macworld contributing editor who specializes in fonts and graphics. She'd rather be sailing.

QUESTION: Why would your computer warranty only be good for 90 days?

ANSWER: Simple. Because computers break down!



Sooner or later, your computer will break down. Or, at any time you could be the victim of a power surge, fire, theft, natural disaster, accidental damage, and more. The odds against you are high.

Unless you have the ready cash to repair or replace your computer system, you need **SAFWARE FIX:IT**. Be insured for mechanical breakdown, (wear and tear) as well as external losses. All in a single policy for as little as \$100. per year. Call free for full information!

1-800-822-2345

Local 614-262-0708 Fax 614-262-1714



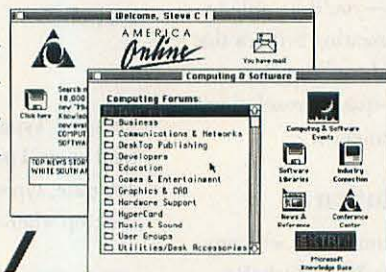
SAFWARE, The Insurance Agency Inc.
2929 N. High Street • P.O. Box 02211
Columbus, OH 43202

Not Available in All States

An Exclusive Connection!

MACWORLD ONLINE

Bringing you exciting, dynamic Macintosh news and information — directly from MACWORLD magazine:



- ▲ The latest product announcements and reviews for smarter decision-making.
 - ▲ Complete databases of Macintosh hardware developers, software publishers, and products.
 - ▲ Up-to-date information on product versions and prices.
 - ▲ Direct connection — talk to MACWORLD editors online.
- PLUS, you'll enjoy software libraries with thousands of Macintosh public domain and shareware programs, live conferences with Macintosh industry leaders, and computing and software support on America Online.

Discover
MACWORLD

on



Order Your **FREE**
America Online Kit Today!

1-800-227-6364,

Ext. 5297

Copyright © 1990 Quantum Computer Services, Inc. America Online is a service mark of Quantum Computer Services, Inc. Macintosh, Mac and MACWORLD are registered trademarks of Apple Computer Inc.

The reason you bought a Macintosh instead of an IBM® PC is the same reason you'll prefer writing with Nisus® 3.0 rather than Word 4.0

A built-in word processing language; noncontiguous text selection; "find and replace" any font, style, size, or color; mix column formats; built-in graphics; and super style sheets down to the character level make Nisus 3.0 easier to learn, easier to use, and much more powerful

You can "Place" any page of a Nisus file containing text and graphics in another Nisus file where it becomes a picture called a "Placed Page Graphic." Double clicking this "Placed Page Graphic" will open the original file for editing. Graphics can be drawn or pasted to three different layers: the text layer, behind the text, and in front of the text giving you total control.

If you're new to the Macintosh word processing market you probably want a word processor that is easy to use. If you've been around for a while, you undoubtedly want a powerful word processor. Chances are you have tried either MacWrite or Microsoft® Word 4.0.

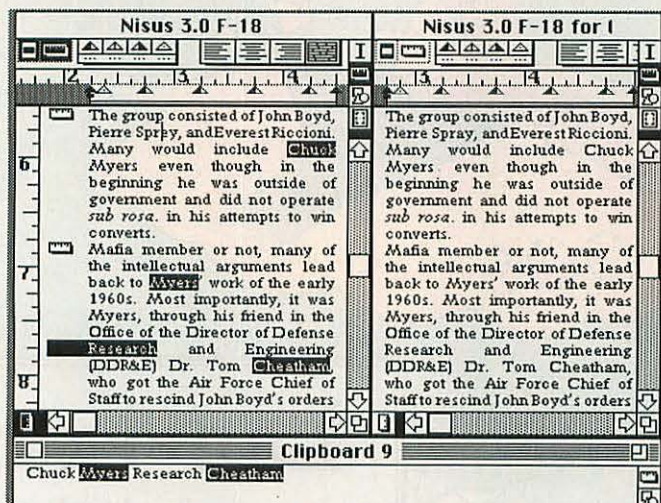
One is easy to use, the other offers power. Both, however, have severe limitations which is why we developed Nisus in the first place. Here with object brevity are just a few of the reasons we know you'll find Nisus 3.0 easy to use with all the power you'll ever want.

Built-in word processing language

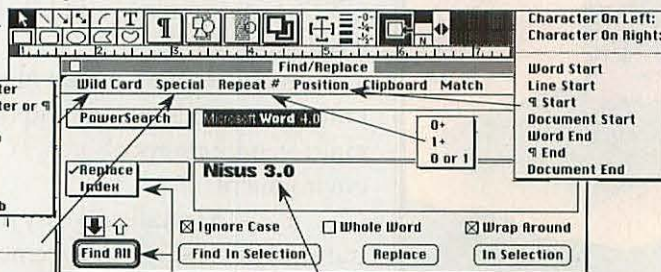
For power, consider the fact that Nisus allows you to create custom routines beyond what we have already done for you, with our built-in word processing language. You don't have to use this feature, but it's there if you need it. It is one of the many features that distinguishes Nisus 3.0 from Word 4.0. It will let you, for example, create routines to index every word in a document, while stripping out *and*, *or*, *the*, *but*, and other nonessential words. One user even built a routine to index all proper names. Another user developed a method to find and correct all double words, periods, and extra spaces. The opportunities are unlimited.

Find and Replace virtually anything

Nisus 3.0 will let you find any text, style, size, or color in any



The automatic file comparison above sent the cursor directly to the first instance where the files differed, which in this case was *Sprey* versus *Spray*. Note the noncontiguous text selection works even in any of the 10 editable clipboards. (Note the vertical ruler on the left which allows you to keep track of where you are.)



The "Find" button converts to a "Find All" button with the touch of the option button. This permits you to replace all of the found text or index it.

Note the use of font, size, style and, if you like, even color as a find and replace criterion

combination. But even more powerful is its ability to find every word in a document at once even in unopened files. For example, suppose you want to index a book where the subject is Ben Franklin. With Word 4.0, you'd have to open each file, go to each instance of Ben Franklin, and index them one by one. With Nisus 3.0 you simply find all Ben Franklins—even in unopened files—and instead of selecting *replace*, you select *index*. Think of the time savings on a long document.

Noncontiguous text selection

Thoughts don't always come in the order you want. Some-

times you type a nugget here and a valued phrase there. So why should you have to select text as though you were a perfect serial thinker. Nisus 3.0's noncontiguous text selection permits you to collect your thoughts on your random walk through the text and bring them all together on one of 10 editable clipboards.

The table above is a brief summary of some of the features that make Nisus 3.0 the most powerful yet easiest to use word processor. Discover why Nisus is shipped with every Macintosh in Korea, why MacUser U.K. named Nisus "1989 Best Word Processor," and why MacWorld Australia uses Nisus as its word processor of choice.

Nisus 3.0 and Word 4.0 Feature Comparison

	Nisus 3.0	Word 4.0
Built-in word processing language	■	
Noncontiguous text selection	■	
Mix column formats	■	
Find all and replace or index	■	
Find any font, style, size, or color	■	
Place text or graphic linked to parent text or graphic file	■	
Find and replace in open or unopened files	■	
Cross-reference text	■	
125,000+ user definable key commands	■	
"Super Style sheets" down to character level	■	
Automatic File Comparison	■	
10 editable clipboards	■	
Mark text as electronic book mark	■	
Built-in Graphics	■	
Rotate text and graphics	■	
Unlimited undos back to "open file"	■	
Reads & Writes Microsoft Word Files	■	■
Vertical Ruler	■	

Free Brochure

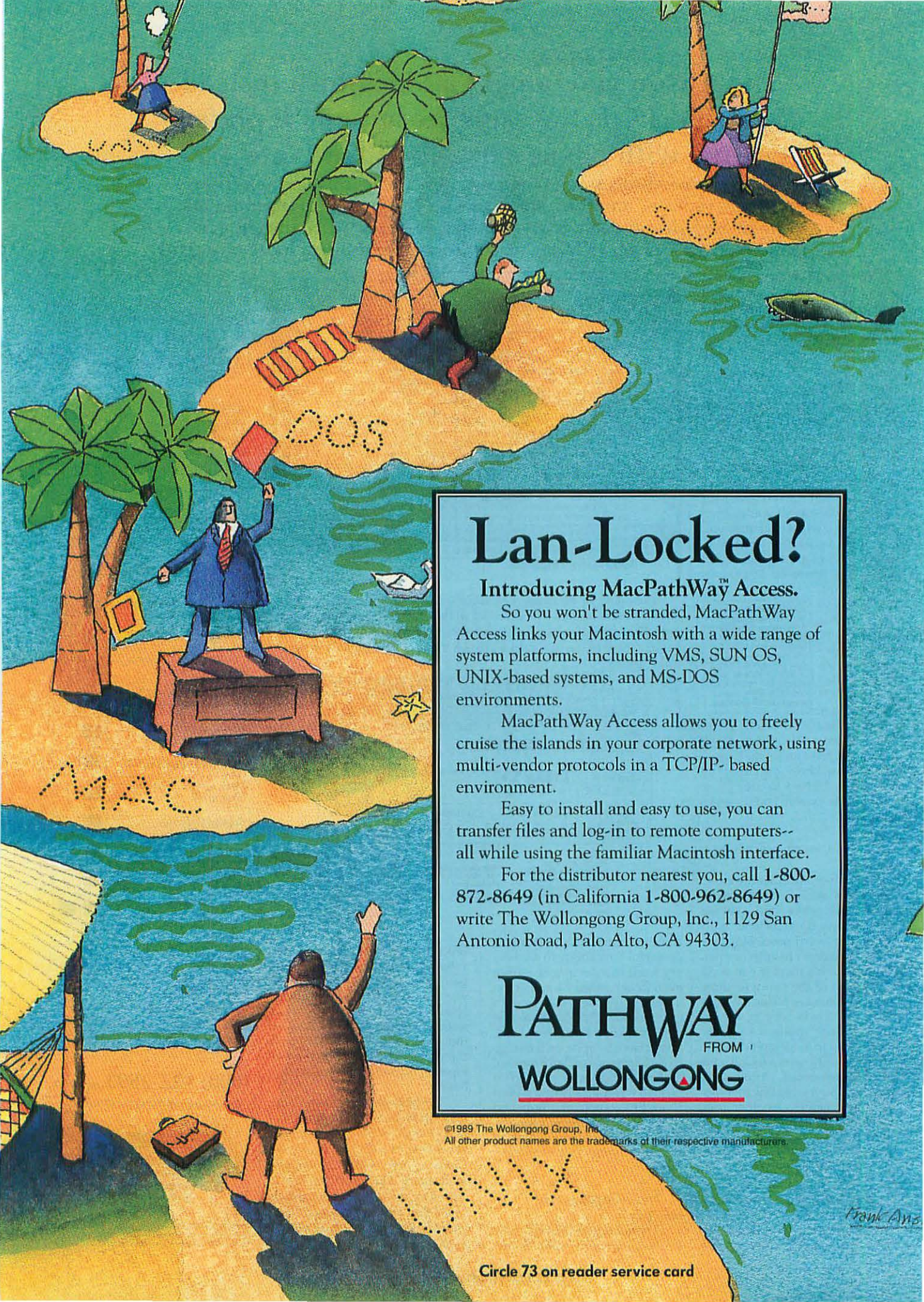
Call today for our free complete brochure "How Nisus 3.0 compares with Microsoft Word 4.0."

(800) 922-2993 ext. 300

In California call (619) 481-1477 ext. 300

PARAGON
concepts, inc.
990 Highland Drive, Suite 312
Solana Beach, CA 92075
(619) 481-1477

IBM is a Registered Trademark of the International Business Machine Corporation. Nisus is a Registered Trademark of Paragon Concepts, Inc. Microsoft is a Registered Trademark of Microsoft Corp.



Lan-Locked?

Introducing MacPathWay™ Access.

So you won't be stranded, MacPathWay Access links your Macintosh with a wide range of system platforms, including VMS, SUN OS, UNIX-based systems, and MS-DOS environments.

MacPathWay Access allows you to freely cruise the islands in your corporate network, using multi-vendor protocols in a TCP/IP-based environment.

Easy to install and easy to use, you can transfer files and log-in to remote computers--all while using the familiar Macintosh interface.

For the distributor nearest you, call 1-800-872-8649 (in California 1-800-962-8649) or write The Wollongong Group, Inc., 1129 San Antonio Road, Palo Alto, CA 94303.

PATHWAY
FROM
WOLLONGONG

©1989 The Wollongong Group, Inc.
All other product names are the trademarks of their respective manufacturers.

Circle 73 on reader service card

UPDATES

Here's our list of the current shipping versions of Mac software at the time we went to press. We hope you'll find it useful—because these days, keeping track of the latest CPU is tough enough.

DiskDoubler version 2.0 transparently integrates into the open-file dialog box in any application, automatically opens compressed files in the Finder with a double-click, does one-step expansion of Stuffit and Packit archives, joins segmented files, and does one-step

file-splitting for large files that need to be made to fit on floppy disks. Salient, 415/852-9567. \$79 new.

Lightspeed Color Layout System version 2.0 includes typographic refinements such as track kerning, hyphenation, justification, automatic text wraparounds, hanging punctuation, stand-up and drop initials, fixed spaces, and superscripts and subscripts. Crosfield & Lightspeed, 617/338-2173. Contact vendor for update policy and list price.

MacDraft version 2.0 has Macintosh II color support; custom fill patterns in black and white or color; enables the user to edit colors and patterns; and gives the user control over color, font, and size of individual characters in a text block. Can rotate text in increments of less than 1 degree. This version includes the ability to save and recall multiple views in a drawing. Innovative Data Design, 415/680-6818. Contact vendor for update policy; \$299 new.

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
1st Aid Kit ★	2.8	512K/3.0	*	
4th Dimension	2.0.1	1MB/6.02	3/90	*
Aatrix	2.01	512K/4.1		\$10
CheckWriter II ★				
Aatrix TimeCard	2.0	512K/4.2		Free
Accountant Inc., Pro	1.03	1MB/6.03		\$19.95
ACCPAC Bedford	1.1	1MB/5.1		\$50
Simply Accounting				
AccuText ★	1.1	4MB/6.02	2/90	*
Adobe Type Manager	1.2	1MB/6.02	2/90	Free
AdWriter	2.0	1MB/6.0		Free
Alter Dark	1.1	512K/3.2	7/90	\$5
Alchemy	1.1	1MB/6.0		\$25
Aldus FreeHand	2.0	1MB/6.03		*
Aldus	4.0	1MB/4.1	9/90	*
PageMaker ★				
Aldus Persuasion	2.0	1MB/6.0		*
AmPack Plus ★	4.2.2	512K/3.2	1/90	\$29.95
Analog Connection	3.0	1MB/5.0	5/90	\$50
WorkBench				
Anatool ★	3.1	512K/3.0		\$35
AntiToxin	1.3	1MB/6.02	1/90	\$15
APL68000	7.0	512K/3.2		*
AppleShare	2.0	512K/3.2		*
File Server				
Archie	2.0	1MB/6.0		\$75
ArchText	2.0	1MB/6.02		Free
Aristotle's Politics	2.0	2MB/6.03		Free
The Art Importer	2.0	1MB/6.0	5/90	\$20
ArtRoom	3.0	512K/3.2		\$199
AutoCalc	2.0	1MB/6.0		\$95
AutoSave II	1.1	512K/4.2	7/90	\$7.50
Aztec C	3.6	512K/4.2		*
BackFax ★	1.02	1MB/6.03	1/90	Free
Back to Basics: Professional	2.0	512K/3.2		\$75
Ball & Stick ★	2.2	1MB/6.0		Free

Product	V.	Req.	Rev.	Price
Bill-It	2.0	1MB/6.03		\$29
Bridge	6.0	512K/3.2		\$17
Business	1.5	1MB/6.02		*
FileVision ★				
Business	1.2	1MB/6.0		*
Sense ★				
Business	3.2	512K/3.2		Free
Session ★				
CA-Cricket Presents	2.0	1MB/6.0		Free
Calculator	2.06	512K/3.2	4/90	\$25
Construction Set ★				
CanOpener	1.1	512K/3.0		Free
Canvas	2.1	1MB/6.0		*
Capture	2.0	1MB/6.0	2/90	\$15
Central System Manager	2.1	1MB/5.0x		*
ChromaScan	1.1	4MB/6.02		Free
Client/Mac	2.0	1MB/6.0		\$370
Colorset ★	1.5	1MB/6.0	6/90	Free
Colleague 2	2.1	2MB/6.03		Free
Comment	2.02	1MB/6.0		*
Commtrack	2.0	1MB/6.0		Free
CommUnity Mac ★	1.3.1	1MB/6.0		*
Complete	1.5	1MB/6.02	3/90	\$30
CompuServe	2.1	512K/3.2		*
Navigator ★				
Computerized	2.2	1MB/6.0		*
Classic Accounting				
ConcertWare	5.1	512K/4.2		\$35
Control	1.5	1MB/4.1		Free
CopyFlow	2.0	2MB/6.0	6/90	Free
Cue	3.0	1MB/6.03		*
Data Desk	3.0	512K/4.02	6/90	\$125
DataMerge	2.0	512K/3.2		Free
dBase Mac ★	1.01	1MB/4.1		Free
Deluxe Music	2.5	512K/6.02	9/89	*
Construction Set				
D.E.S.	4.0	1MB/6.0		*

Product	V.	Req.	Rev.	Price
Design	2.15	5MB/6.03		Free
Dimensions ★				
DeskPaint ★	2.1C	512K/4.2	5/90	Free
Developer Stack	2.0	1MB/6.0		\$15
DiagramMaker ★	1.1	1MB/6.02		*
Digital Darkroom	1.1	1MB/6.02		Free
DiskDoubler	2.0	1MB/6.02		*
DiskExpress II	2.04	1MB/6.0	9/90	*
DiskFit	1.5	512K/4.1	12/89	\$30
DiskTop	4.0	1MB/6.0		*
Display AdBuilder	1.1	1MB/6.03		*
Dollars and Sense	4.1	512K/3.2		*
DragonWave	1.1	1MB/6.03		*
Dreams	1.1	1MB/6.02		*
DynaPerspective	2.0	2MB/6.04		Free
DynDex ★	1.1	1MB/6.0	6/90	Free
Easy Color Paint	1.1	1MB/6.0	9/90	*
Empower II ★	3.03	1MB/4.2		Free
EndLink	1.1	512K/3.2		Free
EndNote	1.2	512K/3.2		Free
Exodus	2.0	1MB/6.0		\$50
Extender GrafPak	3.0	1MB/6.02		\$30
Falcon	2.2	1MB/3.2		\$3
Fastback II	2.1	512K/4.1	12/89	\$30
Fast Forms	2.0	512K/3.2	9/90	\$25
FastLabel	2.0	1MB/6.0		\$36
FaxGate ★	1.02	1MB/6.0		Free
Ferrari	1.6	512K/3.2		\$10
Grand Prix ★				
FetchIt	2.0	512K/6.01		*
FileMaker II ★	1.1	1MB/4.2		*
FilmMaker	2.0	5MB/6.03		*
Finale	2.01	1MB/6.02	5/90	\$5
Financial Analysis	3.0	512K/3.0		*
Findswell	2.01	512K/3.2	3/90	*
Fontographer	3.0	1MB/6.0	5/90	*
FontShare	2.0	1MB/6.0		Free

(continues)

Bold = first time the product is being listed.

★ = minor update.

Req. = min. RAM and system software required.

Rev. = last time (in past year) reviewed this or an earlier version.

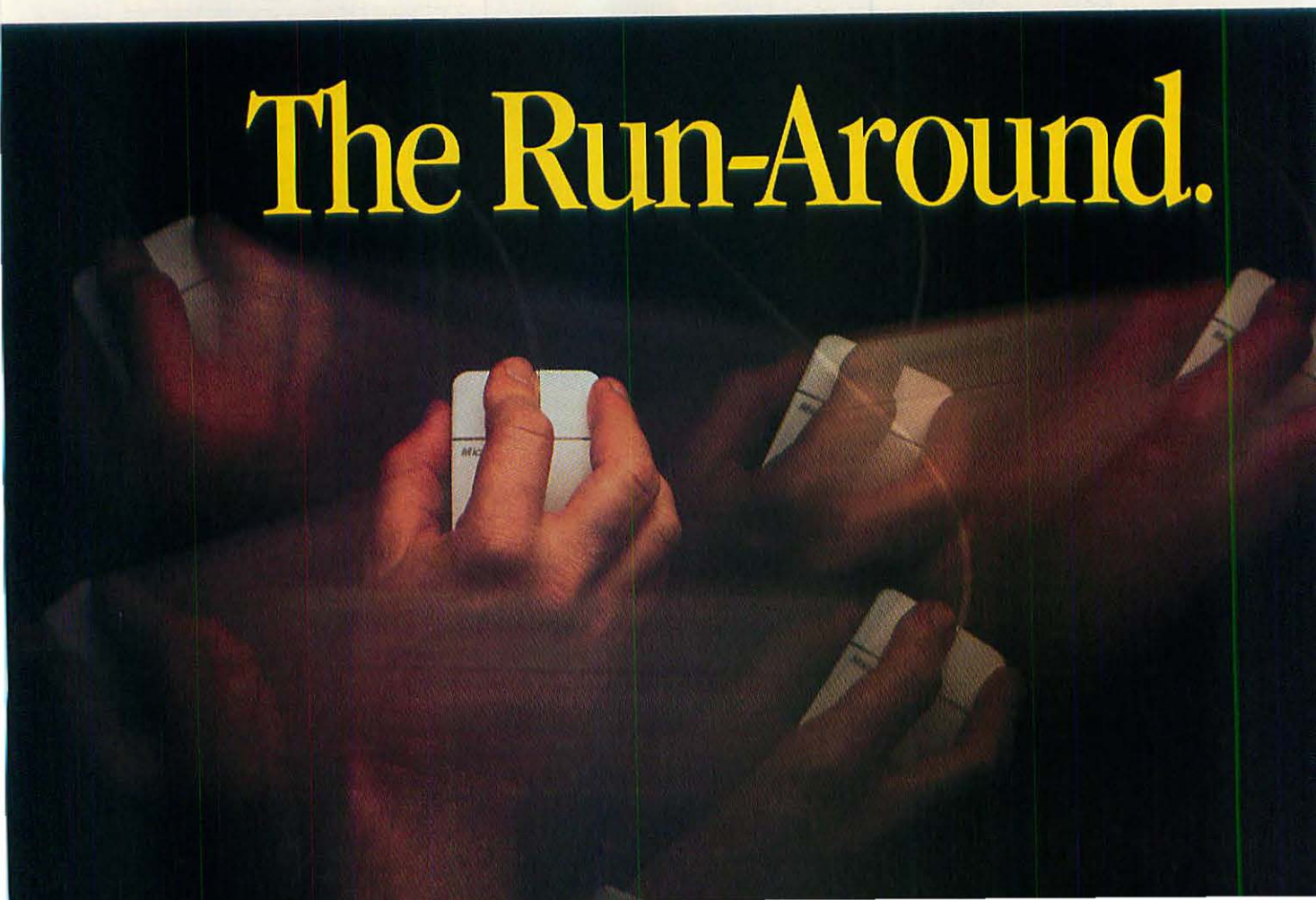
Price = cost for update to registered owners.

* = contact your dealer for update policy.

PRODUCT UPDATES

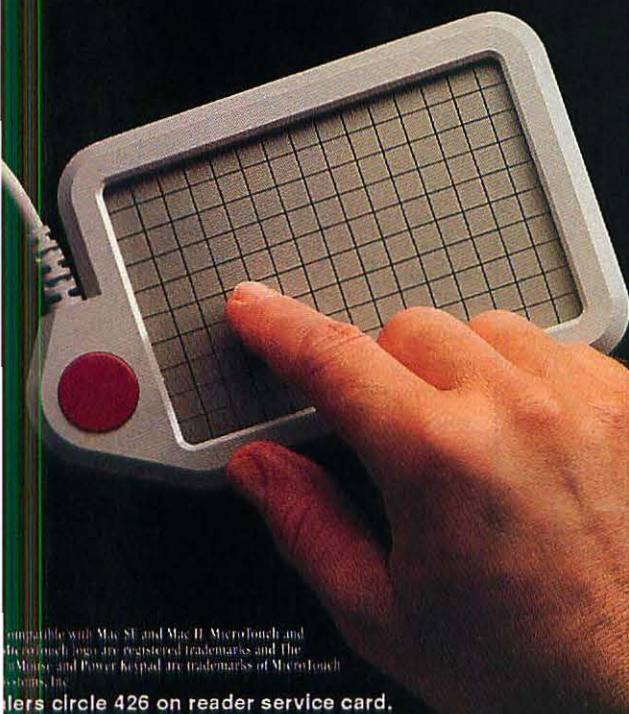
Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price
FormsProgrammer ★	2.03	1MB/6.02		\$15	HyperDA ★	1.2	512K/3.2		\$10	KwiEnvelopes	3.0	512K/4.1		\$10
FoxBase+/Mac ★	2.10	1MB/6.0		\$75	HyperEngine	1.1	1MB/6.03		Free	LAN Package	3.1	1MB/6.0		*
Freedom of Press ★	2.2	1MB/6.0		Free	Developer's Tool ★					Language Systems	1.2	1MB/6.03		*
FreeFlow	3.0	1MB/6.03		Free	HyperLibrary	2.0	1MB/5.0		*	Fortran Compiler ★				
Full Impact ★	1.1	1MB/6.0		Free	HyperPort Chess	2.0	1MB/6.0		\$10	LapLink Mac III	3.0	512K/2.0	7/90	*
FullWrite	1.1	2MB/6.02		Free	HyperWindows ★	1.2	1MB/6.02		\$20	LaserPaint Color II ★	1.02	1MB/6.03		Free
Professional ★					Icon-It	2.0	1MB/6.02	9/90	\$29	LetraStudio	1.5	2MB/6.0		\$45
Gambler Times	3.0	1MB/6.0		\$10	Iconia ★	7.0	1MB/6.0		*	LetriTuck+	2.0	512K/3.2		\$20
GeoQuery	2.0	1MB/6.0		*	Igor ★	1.1	1MB/6.0	5/90	Free	Lightspeed Color	2.0	1MB		*
Gopher ★	2.01	1MB/4.1		\$25	Image Grabber	2.0	1MB/6.02		Free	Layout System				
GQL	2.0	1MB/5.0		*	ImageStudio	1.5	1MB/6.0		\$99	Lookup	2.0	1MB/6.0	5/90	\$15
Great Gantt	1.2	1MB/6.0		Free	ImageWriter LQ	2.0	512K/3.2		Free	LXR TEST ★	4.0.11	1MB/6.0		Free
Great Plains	5.2	1MB/6.0		*	Print Driver ★					Mac86	2.0	1MB/6.02		\$10
Accounting Series					In-CAD	2.0	2MB/6.0		*	Mac286	2.0	1MB/6.02		\$10
HandOff	1.2	1MB/6.0	4/90	*	InfoLogic Envelope ★	6.0	512K/4.0		\$5	Mac3270	2.0	1MB/6.03		*
Hard Disk Partition	3.02	1MB/6.0		\$30	Insight Expert	2.2	1MB/6.0		*	MacAnalyst	2.0	2MB/6.0		\$125
Hard Disk Util	3.0	1MB/6.0		\$65	Accounts Payable					MacArchtrion	4.0	2MB/6.03		Free
Help DA	3.0	1MB/6.0		Free	Insight Expert	2.2	1MB/6.02		*	MacAtlas Paint	2.0	512K/3.2		\$35
HFS Backup	3.0	512K/3.2		\$35	Accounts Receivable					MacClassAds	4.0	1MB/6.0		*
Hybase ★	1.1	1MB/6.0		Free	Inspiration	2.0	1MB/4.2		Free	MacClient ★	1.1	1MB/5.0		Free
HydroMac	2.0	1MB/6.0		*	Instant-Expert Plus	3.0	1MB/5.0		Free	MacConcept	3.0	1MB/6.03		*
HyperAnimator ★	1.5	1MB/6.03		\$29.95	JetLink Express ★	1.01	1MB/6.0		Free	MacDesigner	3.0	2MB/6.0		\$125
HyperCard ★	1.2.5	1MB/6.03		\$10	KidsTime ★	1.2	512K/3.2		\$15	MacDraft	2.0	2MB/6.0.2		*

The Run-Around.



Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price
MacDraw II	1.1	1MB/6.0	*		MacTail	3.5	512K/3.0	*		Microsoft Excel	2.2	1MB/6.0.2	*	
MacEnvelope	5.0	512K/3.2		\$25	MacTerminal *	2.31	512K/3.2		Free	Microsoft File	2.0	512K/3.2	*	
MacEnvelope Plus	2.0	512K/3.2	1/90	\$50	MacToPic	2.0	1MB/6.0		\$25	Microsoft Mail	2.0	1MB/6.0.2	1/90	*
MacFalcon	2.1	1MB/6.0.3	*		MacVision	3.0	1MB/6.0.2		\$50	Microsoft	2.01	1MB/6.0		Free
MacFlow	3.0	1MB/6.0.3		\$30	MacWrite II	1.1	1MB/6.0		Free	PowerPoint				
MacFortran	2.4	512K/4.2	*		Managing	3.0	1MB/6.0.3	6/90	\$49.95	Microsoft Word	4.0	512K/3.2	10/89	*
MacFortran/020	2.4	512K/4.2	*		Your Money					Microsoft Works	2.0	512K/6.0	*	
MacFortran for MPW	1.1	2MB/6.0.2		Free	MapGrafix	2.0	4MB/6.0.3		Free	MindWrite *	2.1	512K/4.2	*	
MacHerbal	2.0	512K/3.2		\$49	MarketMaster	1.4	1MB/6.0.3		\$25	MiniCad +	2.0	1MB/6.0	11/89	*
MacHotel	3.3	1MB/6.0.3		Free	MarkUp	1.02	1MB/6.0	5/90	Free	MinDraw	4.0	512K/4.2		\$17
MacLine	3.0	512K/3.0		\$25	Master Tracks Pro 4	4.12	1MB/4.1	6/90	\$45	MockPackage Plus	4.4	512K/3.2		\$15
MacLinkPlus/Wang VS	4.0	512K/3.2		\$45	MathType	2.1	512K/6.0.2	11/89	*	Utilities				
MacMainFrame	2.1	2.5MB/6.0.2		\$100	Mathlab	1.2	1MB/3.0	*		Modem Artist	2.0	2MB/6.0.2		\$150
3270/CUT					MaxPage *	1.2	512K/3.2		Free	MOMARS	3.1	1MB/6.0.3	*	
MacPhonebook	2.0	512K/3.2	1/90	*	McClint	2.0	1MB/4.2		\$25	Monte Carlo	2.0	1MB/6.0.3		\$60
MacPrint	1.1	1MB/6.0.2		Free	McCPrint	2.0	512K/4.2		\$25	More II *	2.01	1MB/4.1		Free
MacProject II	2.1	1MB/6.0		Free	McMax	2.0	1MB/5.0	*		MSFL: Pro League	2.0	1MB/6.0	*	
MacProof *	3.2.1	1MB/6.0.2	2/90	\$30	Memorybank	3.0	1MB/6.0		Free	Football				
MacRecorder	2.0	512K/3.2	12/89	*	Manager					MultiClip	2.0	512K/6.0.2	8/90	*
MacSafe II		512K/4.2	*		Mesa Graphics	1.03	512K/5.0	*		MultiLedger *	1.1	512K/3.2		Free
MacSchedule	2.0	1MB/6.0		\$30	Plotter Utility					Multi-User	3.01	512K/3.2	*	
MacSmarts	3.0	1MB/6.0	*		MGMStation *	2.5	512K/3.0	*		Appointment Diaries				
MacSpin	3.0	512K/4.2		\$75	MicroPhone II	3.0	512K/4.2	7/90	*	(continues)				

To The Point.



Introducing UnMouse™

	Absolute Control	Function Keys	High Accuracy	Traces	Draws	Saves Space	No Multiple Swaps	No Moving Parts	No Cluttering
Mouse									
Trackball									
UnMouse									

Quit mousing around and get to the point with The UnMouse. It does everything a mouse can — only faster and in less space. To move the cursor, simply touch the glass. To make a selection, merely press.

Mice run off their pads. Hog your desk. And have to be found, oriented and dragged. But The UnMouse is always stationary. And always faster. With its Absolute mode, one million touch points map exactly to the screen. Just touch a point and instantly the cursor goes to the same location.

Plus The UnMouse has additional features a mouse can't touch. Its Power KeyPad provides up to 60 function keys and macros per application. And with its drawing stylus, it even serves as a small, yet powerful graphics tablet. For more information and your nearest dealer:

CALL 1-800-UNMOUSE.

MicroTouch

55 Jonspin Road /Wilmington, MA 01887
508 694 9900 /FAX 508 694 9980
End users circle 449 on reader service card.

Compatible with Mac SE and Mac II. MicroTouch and MicroTouch logo are registered trademarks and The UnMouse and Power KeyPad are trademarks of MicroTouch Systems, Inc.
Users circle 426 on reader service card.

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price
MusicProse	1.01	1MB/6.0	4/90	Free	Publish or Perish	5.0	512K/4.2		\$10	StrataVision 3d *	1.4	2MB/6.03	4/90	\$50
Music Publisher	2.0.3	1MB/6.0		Free	Pyro	4.0	512K/4.1	7/90	\$15	Suitcase II	1.2.6	512KE/4.1	10/89	\$25
MyDiskLabeler III		1MB/6.0		\$25	Q-Sheet A/V	2.0	1MB/6.0		\$50	Super 3D	2.1	512KE/6.02	10/89	Free
MyTimeManager	2.0	1MB/6.0	5/90	*	QuarkXPress	2.12	1MB/6.02		*	SuperGlue II with	2.1	1MB/6.0	1/90	*
Navigate	2.0	1MB/6.0		Free	Quicken *	1.5	512K/3.2	1/90	*	GlueNotes				
Nemesis Go	4.0	512K/4.1		*	QuickLetter *	1.03	512KE/3.2	10/89	Free	SuperLaserSpool	2.0.2	1MB/6.0		\$30
Master					QuickMail	2.2	512KE/3.2		\$95	SuperPaint	2.0	1MB/6.02		\$50
Network DiskFit	1.5	512K/4.1	12/89	\$30	QuickShare	2.0	512KE/3.2		\$75	SuperSpool	5.0	512K/4.1		\$30
The NightWatch *	1.03	512KE/3.2		*	QuickShot *	2.1	1MB/4.2		\$5	Sybil	2.0	1MB/6.0		*
Nisus	2.0	1MB/6.02	9/89	Free	RagTime 3	3.04	2MB/6.0	8/90	\$150	Synchronicity	2.0	512KE/3.2	12/89	\$5
NaPaint *	1.04	512K/3.2		Free	Read-It OCR	2.1	1MB/6.03	12/89	\$29	Systat	5.0	4MB/6.0		\$190
Nutrition Stack	2.0	1MB/6.02		\$20	Personal					Teacher's	2.2	512K/3.2		\$17.95
OmniPage *	2.1	1MB/6.02	2/90	Free	Read-It OCR	3.0	2MB/6.03		*	Rollbook *				
Omni 3	2.0	512KE/3.2		*	Professional					Ternary Plot	3.0	512K/3.2		*
Print/Express					ReadySetGo	4.5	1MB/6.0		*	TextPart *	3.01	1MB/6.0		Free
On Schedule	2.0	1MB/3.0		*	Real Estate Edge	2.0	1MB/6.03		Free	TextScan	3.04	1MB/6.0		\$69.95
PS1 Mustang	2.04	512K/3.2		\$10	Rendezvous	2.5	512KE/4.1		\$15	TGRAF-07/Mac	2.0	2MB/6.0	9/89	*
Flight Simulator					Reports *	1.2	1MB/6.0		Free	Think C	4.0	1MB/5.0	2/90	*
PacerLink	5.0	512K/5.0		*	Retail Engine	3.0	1MB/6.0		*	Timbuktu	3.1	1MB/4.1		*
Panorama	1.5	1MB/4.2		Free	Sales Associate	1.10	1MB/6.03		Free	TimeMinder	2.0	1MB/4.2	9/89	\$50
PEGASYS II	3.2	1MB/6.03		Free	Sales and Market	2.0	1MB/6.0		\$49	Timeslips III	2.0	1MB/6.02	2/90	*
Performer	3.4	1MB/6.0		Free	Forecasting Toolkit					TML Pascal II	3.0	1MB/5.0		\$79.95
Sequencer *					SAM	2.0	1MB/6.0	1/90	\$29.95	TMON *	2.8.4	512K/4.0		*
Personal Golf Stats	2.0	512K/3.2	2/90	Free	ScanMan		1MB/6.0		Free	TOPS/Mac	3.0	512K/3.2		*
Personal Reference	2.0	1ME/6.0		\$10	Model 32					Trapeze *	2.1	1MB/6.0		\$35
Catalog					ScheduleMaker *	3.01	1MB/6.0		\$25	TrueBASIC *	2.02	1MB/6.0		Free
Personal Phone *	1.1	1ME/6.0		*	ScreenSnap *	2.2	1MB/4.2		*	TrueForm *	1.1	1MB/6.2	4/90	Free
PhotoMac	1.5	2MB/6.03		\$75	ScriptEdit	1.1	1MB/6.04	3/90	*	Turbosynth	2.0	1MB/6.03		\$35
PhotoMacEdit	1.5	2MB/6.03		\$30	Second Sight	2.0	1MB/6.02		\$33.75	Typeface Library	1.5	1MB/6.03		*
The Phrase	2.0	1MB/6.0	12/89	Free	Sentinel	2.2	1MB/6.0		\$30	TypeStyler	1.01	1MB/4.1	7/90	*
Thesaurus					Shanghai	2.0	1MB/6.02	2/90	\$13	UNITize *	1.3	512KE/3.2	10/89	\$20
PICT Detective	2.0	512KE/6.0		\$20	SimpleSpn	2.5	512K/3.2		*	UpBeat	2.01	1MB/6.0	8/90	\$75
PixelPaint	2.0	2MB/4.1		\$99	Smart Alarms	2.9.1	512K/3.2		\$12	VersaCAD/	2.11	1MB/6.0		Free
Plains & Simple *	1.06	1MB/3.2		*	SmartForm	1.1	1MB/6.0		Free	Macintosh Edition *				
PostShow	1.1	1MB/6.0		\$35	Assistant *					Vietnam War	2.0	1MB/6.0		*
PowerDraw	3.0	1MB/6.0		*	SmartForm	1.1	1MB/6.0		Free	Vrex *	2.6	1MB/4.2	1/90	*
PowerStation *	2.5.2	512K/4.1		Free	Designer					Virtual	2.0	1MB/3.2	10/89	Free
PowerTools	3.0	4MB/6.0		*	SmartScrap	2.0	1MB/6.03		\$20	Vision	1.1	1MB/6.03		Free
Practica Musica	2.1	512K/3.2		\$10	& The Clipper					Voyager	1.2	1MB/6.0	4/90	*
Printer Interface III	2.0	512K/6.02		\$22.50	Snap *	3.1	1MB/3.0	9/89	*	VMacS	2.0	1MB/6.0		\$25
Pro-Cite *	1.3	512K/4.1		*	SoftPC *	1.3	2MB/6.0	9/89	*	Wall Street	3.0	1MB/5.0		\$150
Professional	2.3	1MB/6.03		Free	Sound Designer	1.5	512K/6.03		\$45	Investor				
Composer					Universal *					White Knight II	11.6	1MB/6.02	7/90	\$35
Professional	2.0	1MB/6.0		\$22	Spelling Coach	3.1	512KE/4.2		*	WillMaker	4.0	512KE/4.2		\$16.50
Image II					Professional					Wild Things *	1.1	1MB/6.0		Free
The Programmer's	2.0	1MB/6.02		\$10	SpellsWell *	2.2	512K/3.2	5/90	\$20	Wingz *	1.1	1MB/6.0		Free
Online Companion					Spinmaker Plus	2.0	2MB/6.0		\$45	Word Finder	2.0	512K/3.2		*
Property		1MB/6.0.1		\$100	Springboard	2.0	1MB/6.0		*	WordPerfect for	1.0.3	1MB/4.2		Free
Management III					Publisher					the Macintosh *				
PropsForms	2.0	1MB/6.03		Free	Stepping Out II	2.0	1MB/4.1		Free	WorksPlus	2.0	1MB/6.03	1/90	*
Prototyper *	2.01	1MB/4.1	9/89	\$79	StickyBusiness	1.06	512KE/6.03		Free	Spell				
Publish-It	1.2	512KE/5.0		*	Still Light	3.0	1MB/6.0		Free	WriteNow	2.2	512K/4.2	9/90	\$49

To have products listed in this section, send upgraded software, an outline of changes since the previous release (indicate if it's a maintenance upgrade), upgrade price, minimum RAM and system software, suggested retail price, company name, mailing address, and phone number to *Updates*, *Macworld*, 501 Second St., San Francisco, CA 94107.

This passport will take you places.

PASSPORT

MACWORLD
EXTRA VAGANZA!

GET YOURS AT THE EXPO.

When you're at the Boston Expo, make sure to pick up your *Macworld Extravaganza Passport*.

Visit the companies listed in your passport, and they'll stamp it.

After your passport is filled, drop it off at the Macworld Booth and you're in the running for our Grand Prize...

A FREE TRIP TO ANY MACWORLD EXPO ANYWHERE IN THE WORLD.

So don't forget to pick up your passport at the Expo. It's your chance to see the world, with Macworld.

MACWORLD

The World Leader on Macintosh® Computing

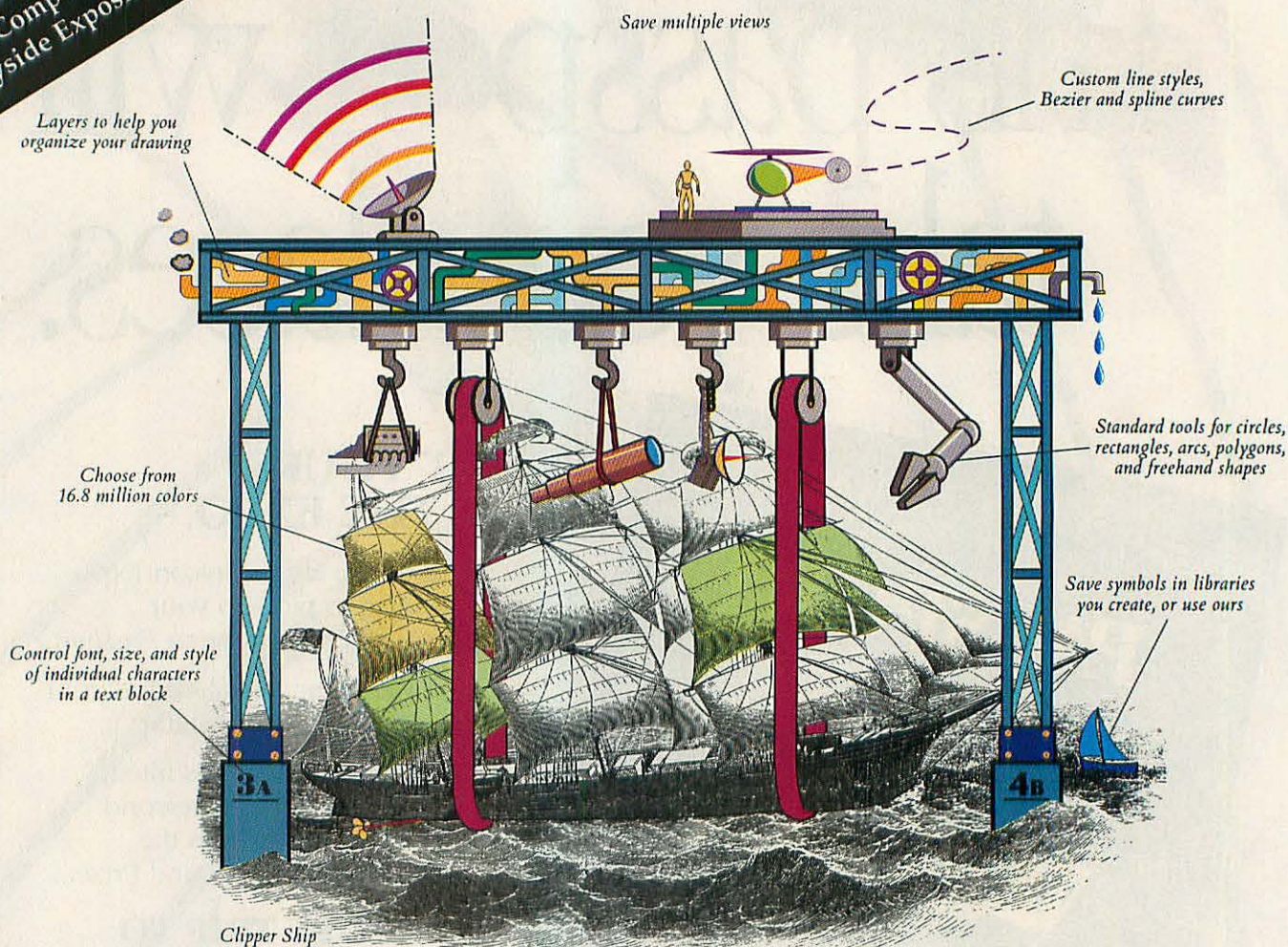
415.243.0505

Certain restrictions apply. Award for Expo attendee based on coach fare with 30 days advance reservations. Value up to \$5000. Winner will be chosen in a drawing.

See us at Macworld Expo Boston, and pick up your passport!

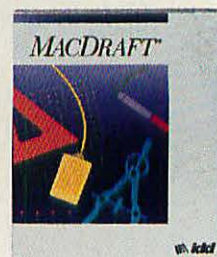
Macworld Magazine Booth • Booth 1306 Bayside • Booth 5404 World Trade Center

Visit Us At
MacWorld At The
CalComp Booth #1022
(Bayside Exposition Center)



HOW TO UPGRADE A CLASSIC.

The original MacDraft® is a classic precision drawing program in its own right. And now, we've upgraded it. Introducing MacDraft 2.0. As you can see, it gives you even more powerful precision drawing tools. Plus many enhanced features like object and text rotation in less than 1° increments, up to 32X zoom, and PostScript®-quality printing. But we didn't change the easy-to-use interface that made the original MacDraft a favorite for over 70,000 users. If you'd like to experience MacDraft 2.0 for yourself, visit your nearest dealer. And see the classic drawing program that's way ahead of its time.



MACDRAFT 2.0

DRAW ON THE POWER OF THE MAC

Demo Disks are available for \$9.95 shipping and handling. Innovative Data Design, Inc., 2280A Bates Ave., Concord, CA 94520, 415-680-6818
Copyright © 1990 Innovative Data Design, Inc. All rights reserved. Innovative Data Design, their logo, and MacDraft are registered trademarks of Innovative Data Design, Inc. PostScript is a registered trademark of Adobe Systems, Inc.

Circle 508 on reader service card

WHERE TO BUY

A Guide to Products Featured in This Issue

This listing provides companies and phone numbers for products mentioned in this issue.

Allow several weeks for responses to reader service card inquiries. Asterisks indicate vendors who prefer to be contacted by phone.

Reader Service



- 701 **Accountant, Inc. Professional** Softsync/Bloc Publishing; 212/685-2080.
- 702 **Acta Advantage** Symmetry Software Corp.; 602/998-9106, 800/624-2485.
- 703 **Adobe Type Manager** Adobe Systems; 415/961-4400, 800/833-6687.
- 704 **Adobe Type Reunion** Adobe Systems; 415/961-4400, 800/833-6687.
- 705 **Aldus FreeHand** Aldus Corp.; 206/628-2320.
- 706 **Aldus PageMaker** Aldus Corp.; 206/628-2320.
- 707 **Aldus Persuasion** Aldus Corp.; 206/628-2320.
- 708 **America Online** Quantum Computer Services; 703/448-8700, 800/227-6364.
- 709 **Apple Color High-Resolution RGB Monitor** Apple Computer; 408/996-1010.
- 710 **Apple Hard Disk SC series** Apple Computer; 408/996-1010.
- 711 **Apple LaserWriter II Series** Apple Computer; 408/996-1010.

ATA Centers

(in order by state)

Alaska Center for Adaptive Technology P.O. Box 6069, Sitka, AK 99835; 907/747-6960.
Technology Resource Center 2801 Lee Ave., Little Rock, AR 72225; 501/663-8331.
Computer Access Center 2425 16th St., #23, Santa

Reader Service

Monica, CA 90405; 213/450-8827.
Special Awareness Computer Center 2975 N. Sycamore Dr., Simi Valley, CA 93026; 805/582-1881.
Special Technology Center 100 View St., #108, Mountain View, CA 94041; 415/961-6789.
Disabled Children's Computer Group 2095 Rose St., Berkeley, CA 94709; 415/841-3224.
AccessAbility Resource Center 1056 E. 19th Ave., Denver, CO 80218; 303/861-6250.
Computer C.I.T.E. 215 E. New Hampshire, Orlando, FL 32804; 407/299-5000.
Aloha Special Technology Access Center 669 Ahua St., Honolulu, HI 96827; 808/834-4092.
R.E.A.D.I. P.O. Box 523, Marian, IA 52302; 319/377-1771.
Technical Aids & Assistance for the Disabled Center 950 W. Roosevelt, Chicago, IL 60608; 312/421-3373.
Technology Resources for Special People 3023 Canterbury, Salina, KS 67401; 913/827-0301.
Disabled Citizens Computer Center Public Library Fourth St., Louisville, KY 40203; 505/561-8637.
Blue Grass Technology Center 898 Georgetown St., Lexington, KY 40505; 606/233-1483.
SpecialLink 36th W. Fifth St., Covington, KY 41011; 606/491-2464.
Center for Adaptive Technology and Educational Resources (CATER) 3340 Severn Ave., #300, Metairie, LA 70002; 504/888-8964.

Reader Service

MA Special Technology Access Center 1-6 Mudge Way, Town Center, Bedford, MA 01730; 617/275-2446.
Living and Learning Resource Centre 601 W. Maple St., Lansing, MI 48906; 517/487-0883.
Pacer Center, Inc. 3826 Chicago Ave. S, Minneapolis, MN 55417; 612/827-2966.
Computer Resource Center 5025 Northrup, St. Louis, MO 63110; 314/776-1996.
Parents, Let's Unite for Kids 1500 N. 30th St., Billings, MT 59101; 406/657-2055.
Carolina Computer Access Center Metro School, 700 E. Second St., Charlotte, NC 28202; 704/342-3004.
Nevada Technology Center 819 Las Vegas Blvd. S, Las Vegas, NV 89101; 702/382-3358.
Techspress, Center for Independent Living 401 Columbia St., Utica, NY 13502; 315/797-4642.
Communication Assistance Resource Service 3201 Marshall Rd., Dayton, OH 45429; 513/298-0803.
Computer and Technology Services (CATS) 3241 N.E. 21st Ave., Portland, OR 97212; 503/246-8551.
Oregon Outreach Technology Access Center 10100 N. MacAlister Rd., Island City, OR 97850; 503/963-4106.
Technology Access Center 2214 Metro Center Blvd., #110, Nashville, TN 37228; 615/248-6733.
East Tennessee Special Technology Access Center University of Tennessee, Rm. 106-A, Knoxville, TN 37996; 615/584-4465.
West Tennessee Special Technology Resource Center

Reader Service

for the Disabled 401 Maple St., P.O. Box 3683, Jackson, TN 38303.
Software Hardware Interlinking Peripherals (SHIP) University United Methodist Church, 5084 De Zalvala Rd., San Antonio, TX 78249; 512/696-1033.
Computer Center for Citizens with Disabilities 320 12th Ave., Rm. 114, Salt Lake City, UT 94103; 801/521-1624.
712 **atOnce** Layered; 617/242-7700, 800/622-4436.

713 **BIX** Byte Information Exchange; 800/227-2983.

714 **Canvas** Deneba Software; 305/594-6965, 800/622-6827.
715 **CD Technology Porta-Drive** CD Technology; 408/432-8698.
716 **Claris CAD** Claris Corp.; 408/987-7000.
717 **CloseView** Apple Computer; 408/996-1010.
718 **ColorBoard 208** RasterOps Corp.; 408/562-4200, 800/468-7600.
719 **ColorBoard 264** RasterOps Corp.; 408/562-4200, 800/468-7600.
720 **ColorBoard 364** RasterOps Corp.; 408/562-4200, 800/468-7600.
721 **ColorCapture** Data Translation; 508/481-3700.
722 **ColorSnap-32** Computer Friends; 503/626-2291, 800/547-3303.
723 **ColorSpace Ili** Mass Microsystems; 408/522-1200,
(continues)

ADVERTISER INDEX

READER SERVICE NUMBER

- 315 ACCO International, 44
- 72 Acius, 256
- Adobe Systems, 328
- Agfa-Compugraphic, 221-223
- 234 Agfa-Matrix, 40-41
- Aldus, 249-251
- 35 Alsys, 76
- 417 American Power Conversion, 105
- 89 Animas, 119
- Anthro, 38
- Apple Computer, 10-11, 84, 271
- 51 Applied Engineering, 39
- 50 Applied Engineering, 111
- 17 Articulate Systems, 89
- 56 Asante Technologies, 48A
- 120 Aura Systems, 64
- BASF, 242
- 381 Berkeley System Design, 74
- 5 Beverly Hills Computer, 366
- 511 Bitstream, 316
- BottomLine Distribution, 375
- 230 Caere Corporation, 134-135
- 122 Calcomp, 36-37
- 16 Casady & Greene, Inc., 8
- 137 Casady & Greene, Inc., 70
- 191 Cayman Systems, Inc., 48B-48C
- 32 CDA Computer Sales, 123-127
- 338 CE Software, 24
- 130 CE Software, 282
- 357 Central Point Software, 120-121
- 71 Charles Schwab, 253
- 8 Chinon America, Inc., 42
- 496 Claris, 65-67
- 497 Claris, 240
- 319 CompuServe, 290
- 25 Computer Associates-AccPac, 291
- 103 Computer Logics, 63
- 98 Cranel, Inc., 324A
- 400 CTA, 321
- 259 Dantz Development, 38
- 45 DataViz, 115
- 404 Daystar Digital, 32
- 477 Daystar Digital, 32
- 241 DCA, 264-265
- 346 Deneba Software, 27
- 271 Diconix, 315
- 242 Digital Vision, 63
- 79 Diskette Connection, 369
- 368 Dr. Mac, Inc., 359-361
- 101 E-Machines, 47
- 60 Educorp, 377
- 154 Ehman, Inc., C3-C5
- 110 EMAC, Inc., 317
- 455 EMAC, Inc., 317
- 12 Engineered Software, 78
- 522 Fifth Generation Systems, 146
- 521 Fifth Generation Systems, 148
- 250 Fifth Generation Systems, 273
- 152 Fox Software, 136
- 6 FreeSoft Co., The, 309
- 11 GCC Technologies, 75
- 119 GCC Technologies, 77
- 318 GCC Technologies, 79
- 204 GCC Technologies, 81
- 195 GE Rents, 322
- 97 Generation X Technologies, 128
- 157 Generic, 318
- 177 Graphsoft, Inc., 62
- 117 Group Technologies, 144
- Hard Drives, 374
- Hardware Express, 367
- 288 Hewlett-Packard, 294-295
- 301 Hewlett-Packard, 296-297
- 343 Hewlett-Packard, 298-299
- 344 Hewlett-Packard, 230-231
- 192 I.D.S. Systems, 268A
- 508 IDD, 340
- Image Club, 46, 98
- 462 IMCS, 116
- 515 IMCS, 118

READER SERVICE NUMBER

- 63 In-Focus, 260
- 38 Inman Software, 132
- 59 Intelligent Resources, 255
- Intuit, 33
- 260 Iomega, 22-23
- 21 Jam Software, 376
- 102 Jasmine, 130
- 392 Kensington Microware, 16
- 30 Kensington Microware, BC
- 377 Kodak, 76
- 197 La Cie, 29
- 199 La Cie, 31
- 125 La Cie, 117
- 342 Lasermax, 331
- 183 Lexpertise, 312
- 224 Liberty Systems, 369
- Lifetree Software, 9
- 205 Linotype, 138
- 160 M/H Group, 30
- 406 MacAcademy, 94-95
- MacAmerica, 302A-302D
- MacAvenue, 45, 112-113
- MacConnection, 52-61
- 498 MacDepot, 367
- 397 MacFriends, 26
- 262 MacFriends, 88
- 434 MacFriends, 110
- 348 MacFriends, 302
- 345 MacFriends, 313
- 434 MacFriends, 110
- 264 MacLand, 362-365
- 465 MacProducts, 368
- 440 MacShopper, 284-286
- 142 MacTel Technology, 372-373
- 78 MacWarehouse, 150-161
- Macworld Expo Int'l, 354
- Macworld Expo Toronto, 355-357
- Macworld Passport, 268B, 339
- 70 MacZone, The, 96A-96H
- 225 Magic Software, 376
- 7 Mainstay, 303
- 34 MathSoft, Inc., 292
- 333 Metro Image Base, Inc., 258
- 57 Microlytics, 50
- 275 MicroNet Technology, 276-277
- Microsoft, IFC-1
- Microtech International, 233-236
- 426 MicroTouch, 336-337
- 449 MicroTouch, 336-337
- 424 Mirror Technologies, 90-91
- 52 Mitsubishi, 92-93, 229
- 31 Monotype, 96
- My Software Company, 114
- 196 National Semiconductor, 268C
- 314 NEC, 72-73
- NEC Technologies, 267
- 316 NewCo Technology, 21
- 258 Nikon, 280
- 468 NoRad, 4
- 75 Outbound, 268D
- 378 Pacific Data Products, 304
- 229 Paracomp, 311
- 253 Paragon, 333
- 37 Personal Training Systems, 35
- 287 Pinnacle Micro, 51
- 436 Pinnacle Sales International, 269
- 356 Pixar, 227
- 198 Portfolio System, 34
- 252 Postcraft International, 102
- 29 Prescience, 28
- 44 Programs Plus, 347-351
- 104 QMS, 327
- Racet, 318A-318B
- 46 Radius, 6-7
- 84 RasterOps, 14-15
- 425 Reference Software, 97
- 149 Rodime, 142
- 517 Safe Computing, 376
- 293 Safeware, 332
- 19 Salient Software, 100

READER SERVICE NUMBER

- 296 ScanCo, 12
- Scitor, 289
- 239 Secure-It, 96
- 423 Serius, 262
- Seybold Seminars, 353
- 297 Shana Corporation, 104
- 481 Sharp-WIZARD, 140
- Shiva, 5
- 62 Sigma Designs, 17
- 74 Sigma Designs, 17
- 105 Silicon Beach Software, 68
- SNA, Inc., 80
- 519 SoftSync/BLOC Publishing, 71
- 208 Sony, 82-83
- 133 Sony, 238
- Spectrum Holobyte, 279
- 210 SPSS, 305
- 127 Storage Dimensions, 245
- 414 Storage Dimensions, 245
- 190 Supermac Technologies, 103
- 216 Symantec, 101
- 96 Symantec, 13
- 237 Symantec S.U.M., 323
- 286 Synergy Software, 80
- 491 Systat, 106
- 332 T/Maker, 18
- 502 Tactic Software, 314
- 143 Tektronix, 108
- 9 Tektronix, 109
- 476 TeleTypesetting, 78
- 313 Texas Instruments, 86-87
- 442 Texas Mac Express, 370-371
- 6 The FreeSoft Co., 309
- 402 3M Data Storage Prod., 230-231
- 516 Third Wave Computing, 358
- 206 Timeslips, 247
- 418 Timeworks, 49
- 304 Traveling Software, 48D
- 93 Varsity, 275
- 27 VeloBind, 48
- 73 Wollongong, 334
- 376 Xerox Imaging Systems, 306

READER SERVICE NUMBER

Software

BUSINESS

- 72 Acius, 256
- Adobe Systems, 328
- Aldus, 249-251
- 496 Claris, 65-67
- 497 Claris, 240
- 259 Dantz Development, 38
- 152 Fox Software, 136
- 157 Generic, 318
- 508 IDD, 340
- 38 Inman Software, 132
- 21 Jam Software, 376
- Lifetree Software, 9
- 160 M/H Group, 30
- 7 Mainstay, 303
- 57 Microlytics, 50
- Microsoft, IFC-1
- My Software Company, 114
- 37 Personal Training Systems, 35
- 198 Portfolio System, 34
- 29 Prescience, 28
- Scitor, 289
- 423 Serius, 262
- 297 Shana Corporation, 104
- SNA, Inc., 80
- 519 SoftSync/BLOC Publishing, 71
- Spectrum Holobyte, 279
- 210 SPSS, 305
- 190 Supermac Technologies, 103
- 491 Systat, 106
- 206 Timeslips, 247
- 73 Wollongong, 334

VERTICAL

- 17 Articulate Systems, 89
- 34 MathSoft, Inc., 292
- 29 Prescience, 28
- Scitor, 289
- 216 Symantec, 101

DATA MANAGEMENT

- 72 Acius, 256
- My Software Company, 114
- 297 Shana Corporation, 104

WORD PROCESSING

- 496 Claris, 65-67
- 497 Claris, 240
- 346 Deneba Software, 27
- 183 Lexpertise, 312
- Lifetree Software, 9
- 253 Paragon, 333
- 425 Reference Software, 97
- 332 T/Maker, 18
- 502 Tactic Software, 314

CAD/CAM

- 12 Engineered Software, 78
- 157 Generic, 318
- 177 Graphsoft, Inc., 62
- 508 IDD, 340

COMMUNICATION

- 17 Articulate Systems, 89
- 338 CE Software, 24
- 45 DataViz, 115
- 404 Daystar Digital, 32
- 477 Daystar Digital, 32
- 241 DCA, 264-265
- 6 FreeSoft Co., The, 309
- 117 Group Technologies, 144
- 287 Pinnacle Micro, 51
- 286 Synergy Software, 80
- 304 Traveling Software, 48D

Continued on page 345

MACWORLD

FREE PRODUCT INFORMATION

1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50

251 252 253 254 255 256 257 258 259 260
261 262 263 264 265 266 267 268 269 270
271 272 273 274 275 276 277 278 279 280
281 282 283 284 285 286 287 288 289 290
291 292 293 294 295 296 297 298 299 300

501 502 503 504 505 506 507 508 509 510
511 512 513 514 515 516 517 518 519 520
521 522 523 524 525 526 527 528 529 530
531 532 533 534 535 536 537 538 539 540
541 542 543 544 545 546 547 548 549 550

51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100

301 302 303 304 305 306 307 308 309 310
311 312 313 314 315 316 317 318 319 320
321 322 323 324 325 326 327 328 329 330
331 332 333 334 335 336 337 338 339 340
341 342 343 344 345 346 347 348 349 350

101 102 103 104 105 106 107 108 109 110
111 112 113 114 115 116 117 118 119 120
121 122 123 124 125 126 127 128 129 130
131 132 133 134 135 136 137 138 139 140
141 142 143 144 145 146 147 148 149 150

351 352 353 354 355 356 357 358 359 360
361 362 363 364 365 366 367 368 369 370
371 372 373 374 375 376 377 378 379 380
381 382 383 384 385 386 387 388 389 390
391 392 393 394 395 396 397 398 399 400

151 152 153 154 155 156 157 158 159 160
161 162 163 164 165 166 167 168 169 170
171 172 173 174 175 176 177 178 179 180
181 182 183 184 185 186 187 188 189 190
191 192 193 194 195 196 197 198 199 200

401 402 403 404 405 406 407 408 409 410
411 412 413 414 415 416 417 418 419 420
421 422 423 424 425 426 427 428 429 430
431 432 433 434 435 436 437 438 439 440
441 442 443 444 445 446 447 448 449 450

201 202 203 204 205 206 207 208 209 210
211 212 213 214 215 216 217 218 219 220
221 222 223 224 225 226 227 228 229 230
231 232 233 234 235 236 237 238 239 240
241 242 243 244 245 246 247 248 249 250

451 452 453 454 455 456 457 458 459 460
461 462 463 464 465 466 467 468 469 470
471 472 473 474 475 476 477 478 479 480
481 482 483 484 485 486 487 488 489 490
491 492 493 494 495 496 497 498 499 500

CATALOG INFORMATION

Please print or type all information

Name Title

Company

Address

City, State, Zip (Zip code needed to ensure delivery)

Phone: Area Code/Number Fax Number

☐ Check box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.95 for a 1-year (12 issue) subscription (U.S. only).

Expires NOVEMBER 26, 1990 S1 September 1990

FREE PRODUCT INFORMATION

Get more valuable information about the products which interest you. There's no cost; no obligation.

Simply print your name, title, address (with zip), telephone number and fax number (if available). Circle the numbers on the card for the products which interest you. Mail the card. We pay the postage! For even faster results, fax to 413-637-4343.

Numbers for advertised products can be found in the ad and in both the Product Index and the Advertiser Index. Products mentioned editorially can be found in the "Where to Buy" section.

MACWORLD

FREE PRODUCT INFORMATION

1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46 47 48 49 50

251 252 253 254 255 256 257 258 259 260
261 262 263 264 265 266 267 268 269 270
271 272 273 274 275 276 277 278 279 280
281 282 283 284 285 286 287 288 289 290
291 292 293 294 295 296 297 298 299 300

501 502 503 504 505 506 507 508 509 510
511 512 513 514 515 516 517 518 519 520
521 522 523 524 525 526 527 528 529 530
531 532 533 534 535 536 537 538 539 540
541 542 543 544 545 546 547 548 549 550

51 52 53 54 55 56 57 58 59 60
61 62 63 64 65 66 67 68 69 70
71 72 73 74 75 76 77 78 79 80
81 82 83 84 85 86 87 88 89 90
91 92 93 94 95 96 97 98 99 100

301 302 303 304 305 306 307 308 309 310
311 312 313 314 315 316 317 318 319 320
321 322 323 324 325 326 327 328 329 330
331 332 333 334 335 336 337 338 339 340
341 342 343 344 345 346 347 348 349 350

101 102 103 104 105 106 107 108 109 110
111 112 113 114 115 116 117 118 119 120
121 122 123 124 125 126 127 128 129 130
131 132 133 134 135 136 137 138 139 140
141 142 143 144 145 146 147 148 149 150

351 352 353 354 355 356 357 358 359 360
361 362 363 364 365 366 367 368 369 370
371 372 373 374 375 376 377 378 379 380
381 382 383 384 385 386 387 388 389 390
391 392 393 394 395 396 397 398 399 400

151 152 153 154 155 156 157 158 159 160
161 162 163 164 165 166 167 168 169 170
171 172 173 174 175 176 177 178 179 180
181 182 183 184 185 186 187 188 189 190
191 192 193 194 195 196 197 198 199 200

401 402 403 404 405 406 407 408 409 410
411 412 413 414 415 416 417 418 419 420
421 422 423 424 425 426 427 428 429 430
431 432 433 434 435 436 437 438 439 440
441 442 443 444 445 446 447 448 449 450

201 202 203 204 205 206 207 208 209 210
211 212 213 214 215 216 217 218 219 220
221 222 223 224 225 226 227 228 229 230
231 232 233 234 235 236 237 238 239 240
241 242 243 244 245 246 247 248 249 250

451 452 453 454 455 456 457 458 459 460
461 462 463 464 465 466 467 468 469 470
471 472 473 474 475 476 477 478 479 480
481 482 483 484 485 486 487 488 489 490
491 492 493 494 495 496 497 498 499 500

CATALOG INFORMATION

Please print or type all information

Name Title

Company

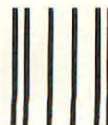
Address

City, State, Zip (Zip code needed to ensure delivery)

Phone: Area Code/Number Fax Number

☐ Check box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.95 for a 1-year (12 issue) subscription (U.S. only).

Expires NOVEMBER 26, 1990 S2 September 1990



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906



PRODUCT INDEX

READER SERVICE
NUMBER

EDUCATIONAL

- 183 Lexpertise, 312
- 406 MacAcademy, 94-95
- 37 Personal Training Systems, 35

Fonts

- 511 Bitstream, 316
- Image Club, 46, 98
- 31 Monotype, 96
- 252 Postcraft International, 102

Graphics/Desktop Publishing

- Adobe Systems, 328
- Aldus, 249-251
- 35 Alsys, 76
- 497 Claris, 240
- 25 Computer Associates-AccPac, 291
- 346 Deneba Software, 27
- 242 Digital Vision, 63
- 12 Engineered Software, 78
- 97 Generation X Technologies, 128
- 157 Generic, 318
- 177 Graphsoft, Inc., 62
- 508 IDD, 340
- Image Club, 46, 98
- 183 Lexpertise, 312
- 333 Metro Image Base, Inc., 258
- 229 Paracomp, 311
- 356 Pixar, 227
- 252 Postcraft International, 102
- 46 Radius, 6-7
- 84 RasterOps, 14-15
- 297 Shana Corporation, 104
- 105 Silicon Beach Software, 68
- 190 Supermac Technologies, 103
- 476 TeleTypesetting, 78
- 418 Timeworks, 49
- 27 VeloBind, 48

Personal Business/Home

- 71 Charles Schwab, 253
- 496 Claris, 65-67
- My Software Company, 114
- 27 VeloBind, 48

Entertainment

- 137 Casady & Greene, Inc., 70
- 252 Postcraft International, 102
- Spectrum Holobyte, 279

Networking

- 56 Asante Technologies, 48A
- 191 Cayman Systems, Inc., 48B-48C
- 241 DCA, 264-265
- 117 Group Technologies, 144
- 21 Jam Software, 376
- 160 M/H Group, 30
- 304 Traveling Software, 48D
- 73 Wollongong, 334

Languages/Development Systems

- 423 Series, 262

Utilities

- 381 Berkeley System Design, 74
- 130 CE Software, 282
- 357 Central Point Software, 120-121
- 259 Dantz Development, 38
- 250 Fifth Generation Systems, 273
- 521 Fifth Generation Systems, 148
- 522 Fifth Generation Systems, 146
- 21 Jam Software, 376
- 225 Magic Software, 376
- 316 NewCo Technology, 21
- 19 Salient Software, 100
- 96 Symantec, 13
- 237 Symantec S.U.M., 323
- 237 Symantec S.U.M., 325
- 502 Tactic Software, 314

READER SERVICE
NUMBER

Miscellaneous

- Aldus, 249-251
- 17 Articulate Systems, 89
- 60 Educorp, 377
- 377 Kodak, 76
- 425 Reference Software, 97
- 19 Salient Software, 100
- 96 Symantec, 13
- 216 Symantec, 101

Hardware

Computer Systems

- Apple Computer, 10-11, 84, 271
- 32 CDA Computer Sales, 123-127
- Hardware Express, 358
- 262 MacFriends, 88
- 348 MacFriends, 302
- 397 MacFriends, 26
- 434 MacFriends, 110
- 75 Outbound, 268D
- 442 Texas Mac Express, 370-371

Printers

- Agfa-Compugraphic, 221-223
- 271 Diconix, 315
- 11 GCC Technologies, 75
- 119 GCC Technologies, 77
- 204 GCC Technologies, 81
- 318 GCC Technologies, 79
- 288 Hewlett-Packard, 294-295
- 301 Hewlett-Packard, 296-297
- 343 Hewlett-Packard, 298-299
- 344 Hewlett-Packard, 300-301
- 342 Lasermax, 331
- 345 MacFriends, 313
- 52 Mitsubishi, 92-93
- 52 Mitsubishi, 229
- NEC Technologies, 267
- 378 Pacific Data Products, 304
- 104 QMS, 327
- 9 Tektronix, 109
- 143 Tektronix, 108
- 313 Texas Instruments, 86-87

Boards

- 404 Daystar Digital, 32
- 477 Daystar Digital, 32
- 97 Generation X Technologies, 128
- 196 National Semiconductor, 268C
- 436 Pinnacle Sales International, 269
- 84 RasterOps, 14-15
- 89 Animas, 119
- 230 Caere Corporation, 134-135
- 8 Chinon America, Inc., 42
- 400 CTA, 321
- 288 Hewlett-Packard, 294-295
- 301 Hewlett-Packard, 296-297
- 343 Hewlett-Packard, 298-299
- 344 Hewlett-Packard, 230-231
- 52 Mitsubishi, 92-93
- 258 Nikon, 280
- 376 Xerox Imaging Systems, 306

Display

- 120 Aura Systems, 64
- 101 E-Machines, 47
- 154 Ehman, Inc., C3-C5
- 63 In-Focus, 260
- 348 MacFriends, 302
- 434 MacFriends, 110
- 52 Mitsubishi, 229
- 314 NEC, 72-73
- 46 Radius, 6-7
- 517 Safe Computing, 376
- 62 Sigma Designs, 17
- 74 Sigma Designs, 17

READER SERVICE
NUMBER

Modems

- 50 Applied Engineering, 111
- 51 Applied Engineering, 39
- Shiva, 5

Hard Disks/Storage

- 89 Animas, 119
- 50 Applied Engineering, 111
- 51 Applied Engineering, 39
- 98 Cranel, Inc., 324A
- 154 Ehman, Inc., C3-C5
- 110 EMAC, Inc., 317
- 455 EMAC, Inc., 317
- 250 Fifth Generation Systems, 273
- 521 Fifth Generation Systems, 148
- 522 Fifth Generation Systems, 146
- 11 GCC Technologies, 75
- 119 GCC Technologies, 77
- 204 GCC Technologies, 81
- 318 GCC Technologies, 79
- 192 I.D.S. Systems, 268A
- 260 Iomega, 22-23
- 102 Jasmine, 130
- 125 La Cie, 117
- 197 La Cie, 29
- 199 La Cie, 31
- 224 Liberty Systems, 369
- 205 Linotype, 138
- 465 MacProducts, 368
- 275 MicroNet Technology, 276-277
- Microtech International, 233-236
- 424 Mirror Technologies, 90-91
- 287 Pinnacle Micro, 51
- 149 Rodime, 142
- 127 Storage Dimensions, 245
- 414 Storage Dimensions, 245
- 442 Texas Mac Express, 370-371
- 516 Third Wave Computing, 358

Video

- 97 Generation X Technologies, 128
- 59 Intelligent Resources, 255
- 465 MacProducts, 368
- 46 Radius, 6-7
- 84 RasterOps, 14-15
- 516 Third Wave Computing, 358

Expansions/Upgrades

- 50 Applied Engineering, 111
- 51 Applied Engineering, 39
- 120 Aura Systems, 64
- 516 Third Wave Computing, 358

Software Security Device

- 417 American Power Conversion, 105
- 16 Casady & Greene, Inc., 8
- 239 Secure-It, 96

Input Devices

- 89 Animas, 119
- 462 IMCS, 116
- 462 IMCS, 118
- 30 Kensington Microware, BC

Miscellaneous

- 120 Aura Systems, 64
- 60 Educorp, 377
- 110 EMAC, Inc., 317
- 455 EMAC, Inc., 317
- 63 In-Focus, 260
- 378 Pacific Data Products, 304
- 481 Sharp-WIZARD, 140
- 304 Traveling Software, 48D
- 93 Varityper, 275
- 27 VeloBind, 48

READER SERVICE
NUMBER

Accessories

Floppy Disks/Holders

- 402 3M Data Storage Prod., 230-231
- BASF, 242
- 208 Sony, 82-83

Furniture

- Anthro, 38
- 296 ScanCo, 12

Services

- 71 Charles Schwab, 253
- 319 CompuServe, 290
- 195 GE Rents, 322
- 406 MacAcademy, 94-95
- 293 Safeware, 332

Miscellaneous

- 315 ACCO International, 44
- 392 Kensington Microware, 16
- 426 MicroTouch, 336-337
- 449 MicroTouch, 336-337
- 468 NoRad, 4
- 296 ScanCo, 12

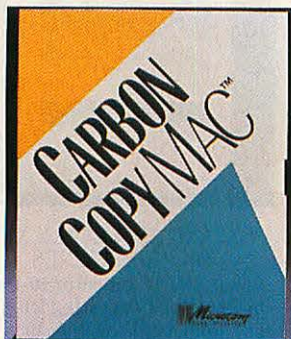
Mail Order

- 5 Beverly Hills Computer, 366
- BottomLine Distribution, 375
- 32 CDA Computer Sales, 123-127
- 79 Diskette Connection, 369
- 368 Dr. Mac, Inc., 359-361
- 60 Educorp, 377
- Hard Drives, 374
- Hardware Express, 358
- MacAvenue, 45, 112-113
- MacConnection, 52-61
- 498 MacDepot, 367
- 262 MacFriends, 88
- 345 MacFriends, 313
- 348 MacFriends, 302
- 397 MacFriends, 26
- 434 MacFriends, 110
- 264 MacLand, 362-365
- 465 MacProducts, 368
- 440 MacShopper, 284-286
- 142 MacTel Technology, 372-373
- 78 MacWarehouse, 150-161
- 70 MacZone, The, 96A-96H
- 44 Programs Plus, 347-351
- 442 Texas Mac Express, 370-371

Reader Service	Reader Service	Reader Service	Reader Service
800/522-7979.	Systems; 303/477-2388.	760 Heart Data Corp.; 818/998-1691, 800/999-8133.	Dimensions; 408/879-0300.
723 ColorSpace FX Mass Microsystems; 408/522-1200, 800/522-7979.	F	761 iDS 408/441-0500, 800/733-0078.	784 MacInTax SoftView; 805/385-5000, 800/622-6829.
724 ColorSpace Plus/SE Mass Microsystems; 408/522-1200, 800/522-7979.	741 File Force ACIUS; 408/252-4444, 800/538-8157.	762 La Cie; 503/691-0771, 800/999-0143.	• Macintosh Display Card 4•8 Apple Computer; 408/996-1010.
• Communi-Mate The Asyst Company; 708/816-8580.	742 Finale Coda Music Software; 612/854-1288.	763 Liberty Systems; 408/983-1127.	785 Macintosh Display Card 8•24 Apple Computer; 408/996-1010.
725 CompuServe Information Services CompuServe; 614/457-8600, 800/348-8199.	743 Fontina Eastgate Systems; 617/924-9044, 800/562-1638.	764 MacProducts; 512/343-9560, 800/622-3475.	786 Macintosh Display Card 8•246C Apple Computer; 408/996-1010.
726 ComputerEyes Digital Vision; 617/329-5400.	744 FrameGrabber324NC RasterOps Corp.; 408/562-4200, 800/468-7600.	765 Maxcess; 215/928-1213, 800/356-2892.	787 MacIra Digital Communications Associates; 404/442-4000, 800/241-4762.
727 ComputerEyes Professional Digital Vision; 617/329-5400.	745 FullWrite Professional Ashton-Tate; 213/329-8000, 800/227-4866.	766 MicroNet Technology; 714/837-6033.	• MacProject II Claris Corp.; 408/987-7000.
728 Connect Business Information Network Connect; 408/973-0110, 800/262-2638.	G	767 Microtech International; 203/468-6223, 800/626-4276.	788 MacRecorder Farallon Computing; 415/596-9100.
• Correct Grammar for the Macintosh Lifetree Software; 415/541-7864, 800/543-3837.	• GENie General Electric Information Services; 301/340-5000, 800/638-9636.	768 Mirror Technologies; 612/633-4450, 800/654-5294.	789 MacroMind Director MacroMind; 415/442-0200.
D	746 Genlock Converter Specialized Computer Systems; 415/370-8200.	769 PCPC; 813/884-3092.	Mac to IBM
729 DataPak Series Mass Microsystems; 408/522-1200, 800/522-7979.	747 Grade Machine Misty City Software; 206/828-3107.	770 PLI; 415/657-2211, 800/288-8754.	790 Andrew/KMW Systems Corp.; 512/338-3000.
730 Delphi Delphi; 617/491-3393, 800/544-4005.	748 Grammatik Mac Refer- ence Software Interac- tive; 415/541-0222, 800/872-9933.	771 Procom Technology; 714/549-9449.	• APDA -Apple Computer; 800/282-2732.
731 DeskWriter Hewlett- Packard; 800/752-0900.	H	772 Relax Technology; 415/471-6112, 800/848-1313.	791 Apple Computer; 408/966-1010.
732 DigiVideo Aapps Corp.; 408/735-8550.	Hard Disks	773 Rodime Systems; 407/994-5585.	792 Avatar Corp.; 508/435- 6872, 800/282-3270.
733 DisplayServerSE-TV Option Lapis Technologies; 415/748-1600.	749 Advanced Gravis; 604/434-7274, 800/663-8668.	774 Ruby Systems; 415/967-1187, 800/888-1668.	793 Cayman Systems; 617/494-1999.
734 Dream Machine: The Visual Computer The Voyager Company; 213/451-1383.	750 Apple Computer; 408/996-1010.	775 Storage Dimensions; 408/879-0300.	794 CE Software; 515/224-1995.
735 DT2879-60HZ Data Translation; 508/481-3700.	751 Bay Micro Systems; 415/563-8392.	776 SuperMac Technology; 408/245-2202.	795 Connectivité Corp.; 914/592-2853.
E	752 CMS; 714/259-9555.	777 Tallgrass Technologies; 913/492-6002, 800/825-4727.	796 Digital Communications Associates; 404/442- 4000, 800/241-4762.
736 EasyAccess Apple Computer; 408/996-1010.	753 Cutting Edge; 307/789-0582, 800/443-5199.	778 Western Digital; 714/863-0102.	797 Emerald Technology; 206/485-8200, 800/222-6174.
737 Easy ColorPaint Creative Software; 201/665-9361, 800/367-6899.	754 Deltaic Systems; 408/441-1240.	779 HyperCard Apple Computer; 408/996-1010.	798 IdeAssociates; 508/468-1155.
738 Edit Worx Specialized Computer Systems; 415/370-8200.	755 Dolphin Systems; 714/558-3220.	I	799 Intercon Systems Corp.; 703/709-9890.
739 Encore Passport Designs; 415/726-0280.	756 Ehman; 307/789-3830, 800/257-1666.	780 Icon-It Tactic Software; 305/378-4110, 800/344-4818.	• Microsoft Corp.; 206/882-8080, 800/426-9400.
740 EPS Teacher's Assistant Executive Productivity	757 EMAC; 415/683-2335, 800/821-0806.	781 ImageWriter II Apple Computer; 408/996-1010.	800 Mitem Corp.; 408/559-8801.
	758 FWB; 415/474-8055.	J	801 Novell; 801/379-5900, 800/526-5463.
	759 GCC Technologies; 617/890-0880, 800/422-7777.	782 Jigsaw Britannica Software; 415/546-1866, 800/572-2272.	802 Oracle Corp.; 415/506-7000, 800/345-3267.
	• Hard Drives Interna- tional; 602/967-4999, 800/234-3475.	M	803 Perle Systems; (continues)

Programs Plus

Plenty
For
Your
Mac
Money!



REMOTE CONTROL OF ANY MAC!

Carbon Copy Mac by Microm is remote control software that lets one Mac remotely operate another Mac's peripherals, screen, keyboard and mouse. You transfer files without EMAIL, access messages remotely, and share expensive peripherals such as CD-ROM drives and fax/modems. Unparalleled tool for training and demos. 3 level password security.
Suggested Retail..... \$199.
Programs Plus Price..... \$119.

win!

a
LaserWriter® IISC!
Make a purchase
from Programs Plus
and automatically
enter our drawing.
For details
turn the page.



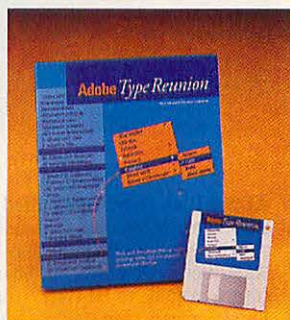
NETWORKING'S GREAT

Flash by Beagle Bros. lets you transfer files over AppleTalk® You can send to individuals or groups, just by dropping files into folders. Unlimited users per AppleTalk zone.
Suggested Retail..... \$199.95
Programs Plus Price..... \$129.



CAPTURE ANY MACINTOSH SCREEN

Exposure by Preferred Publishers is the one-step screen graphics solution. The first fully integrated screen capture, painting, and formatting of color and gray-scale images. Integrates painting and font capability for touch-up and creative image control.
Suggested Retail Price..... \$99.95
Programs Plus Price..... \$52.



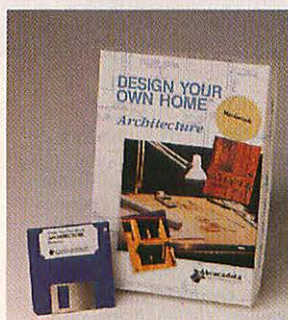
ORGANIZE YOUR FONTS

Adobe Type Reunion™ by Adobe reorganizes, groups and shortens pull down font menus to save you time hunting and scrolling. Reduces typical font menu length by 75%-80% and gives you immediate access to every font available on Mac. Works for Adobe, AGFA Compugraphic, Bitstream, Linotype, Monotype and Casady & Greene fontware.
Suggested Retail..... \$65.
Programs Plus Price..... \$39.



BEATS MOUSE HANDS DOWN

UnMouse by MicroTouch does everything mouse can do, only faster in less space. In Absolute Mode, one million touch points map exactly to screen. Just touch—cursor relocates instantly. Power KeyPad™ provides up to 60 function keys and macros per application. Drawing stylus serves as a small, yet powerful graphics tablet.
Suggested Retail..... \$235.
Programs Plus Price..... \$189.



DESIGN AND LAYOUT MADE EASY

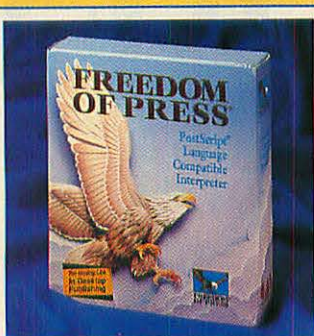
Design Your Own Home Architecture by Abracadata—Visualize construction or renovations in an easy-to-run package. Draw floor plans, side views of buildings. Add structural details in no time! Dozens of sample plans. Library of pre-drawn shapes. Calculates distances, areas, angles. For beginners and pros.
Suggested Retail..... \$99.95
Programs Plus Price..... \$59.



TELECOMMUNICATIONS MIRACLE

White Knight by Free Soft works with all common protocols and any modem. 300 to 57,600 baud. Capture buffer as large as available memory. Works with any type and font size. On screen meters. Auto redial. Emulates TTY, VT52, VT100 and VT102 terminals. Includes Mac-to-Mac file transfer and free GENIE subscription.
Suggested Retail Price..... \$139.
Programs Plus Price..... \$85.

Programs, Peripherals

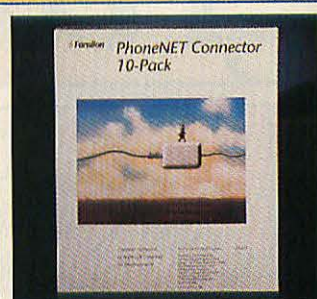


PRINT POSTSCRIPT TO NON-POSTSCRIPT PRINTERS!
Freedom of Press by Custom Applications—Software solution for printing PostScript from Mac to non-PostScript printers, including HP DeskWriter®, LaserJet III, PaintJet®, and many more. Comes with 35 scalable fonts compatible with those of Apple LaserWriter Plus®. Requires Mac II, IICX, IIX, IICL, IIFX, or SE-30 with 2MB minimum.
 Suggested Retail..... \$495.
Programs Plus Price..... \$255.

MainStay Capture.....	49.
Mac Schedule v2.0.....	149.
Microcom Software Virex.....	<i>SPECIAL</i> 52.
Virex (10 Pack).....	<i>SPECIAL</i> 317.
Microlytics GOFer v2.0.....	39.
Now Software Screen Locker.....	45.
Now Utilities.....	89.
ON Technology On Location.....	75.
Peter Norton Norton Utilities.....	84.
Salient Software Inc. Disk Doubler 2.0.....	<i>SPECIAL</i> 50.
Software Innovations HandOff v1.1.....	31.
HandOff II.....	52.
Solutions International SmartScrap & The Clipper II.....	45.
Super Glue II v2.01.....	61.
SuperMac Software SuperSpool v5.0 or Diskfit v1.5.....	58.
SuperLaserSpool v2.02.....	87.
Symantec Symantec Utilities (SUM II).....	99.
Symantec AntiVirus (SAM).....	67.
Synex Mac Envelope v5.....	57.
Mac EnvelopePlus v2.0.....	159.
Vertical Solutions FastEnvelope or FastCAT.....	50.
FastLabel v2.0.....	89.
WildFlower Software SnapJot.....	32.

Accounting

Aatrix Software Aatrix Checkwriter II v2.8.....	29.
---	-----



EXPAND APPLTALK NET ON PHONE LINES
PhoneNET® Connector 10-Pack by Farallon Computing lets you use ordinary phone lines to connect Mac Plus, SE, SE/30, II, IIX, IICX, Ilei, LaserWriter II, LQ, II NT, II NTX, and servers on AppleTalk network. Includes connectors, 7-foot cables and hardware for 10 devices. Compatible with LocalTalk cabling, FlashTalk and DaynaTalk.
 Suggested Retail..... \$395.
Programs Plus Price..... \$198.

Check Mark MultiLedger.....	235.
Payroll.....	175.
Cash Ledger.....	115.
Computer Associates ACCPAC Simply Accounting.....	225.
Digital Etc. Business Sense.....	269.
Intuit Quicken v1.5.....	35.
Layered At Once!.....	285.
Insight Expert INV. or Payroll.....	395.
Insight Expert GL, AR, or AP.....	395.
MECA Managing Your Money v3.0.....	122.
Monogram Dollars & Sense v5.0.....	81.
Nolo Press WillMaker v3.0.....	32.
Reality Software Wealth Builder.....	165.
Survivor Software InvoicIt.....	49.
MacMoney v3.5.....	59.
Timeslips Timeslips III v2.0.....	<i>SPECIAL</i> 169.

HyperMedia & Languages

Aladdin Systems Programmers Assistants.....	75.
Antic Software Hot Spot.....	39.
Apple Computer HyperCard.....	42.
Borland Turbo Pascal.....	68.
Digital Smalltalk/vmac.....	125.
Microsoft Quick Basic.....	64.
Millennium Software HyperX v3.0.....	65.
Now Software Prototyper.....	185.
Silicon Beach SuperCard v1.5.....	189.
SoftStream Authenticate w/Mutate.....	79.
HyperHIT v2.2.....	125.
Somak Software ScriptEdit.....	49.
Spinnaker Software Plus v2.0.....	105.
Symantec Think C.....	165.
Think Pascal v3.0.....	185.

Just Enough Pascal.....	52.
Symmetry HyperDA.....	45.
The Result Software Dialoger Pro. v1.5.....	85.

Modems/FAX

Abaton InterFax 12/48.....	265.
InterFax 24/96.....	419.
Anchor Automation MacPac 2400E.....	169.
Mac Send Fax.....	205.
Mac 2400E5 w/MNP.....	239.
Mac 96 E4 External.....	759.
Applied Engineering DL/Mac Send Fax Option.....	59.
AE 3 1/2 Ext. Disk Drive.....	<i>SPECIAL</i> 217.
DataLink Express.....	194.
DataLink Mac Portable.....	235.
DataLink Mac.....	279.
Dove Dove Fax Desktop.....	279.
Hayes Microcomputing Smartmodem 2400M.....	429.
Smartcom II v3.1C.....	84.
V2400 Baud Modem.....	459.
V2400 Internal w/Software.....	489.
V9600 Baud Modem.....	759.
Intel 2400 EX w/QuickLink II.....	195.
2400 EX MNP w/QuickLink II.....	249.
Orchid Orchid Fax Modem.....	459.
Practical Peripherals Practical Modem 2400SA.....	179.
MacCommPack.....	225.
Prometheus Promodem 2400M External.....	199.
Travel Modem.....	205.
Promodem 2400SE Internal.....	209.
Promodem 2400MII Internal.....	205.
Promodem 2400M Fax.....	209.
MaxFax.....	<i>SPECIAL</i> 285.
Promodem 9600M Plus External.....	750.
MACKNOWLEDGE	85.
Shiva NetModem V2400.....	425.
NetModem v.32 (9600 BPS).....	1429.
Supra Corporation Supra Modem 2400.....	119.
Supra Modem 2400 MacPac.....	179.



LOW COST QUALITY
AE 3.5 Disk Drive by Applied Engineering features the same reliable Sony mechanism that Apple uses. 800K with option of future upgrade to 1.44 MEG. High impact plastic case stacks. Exact match to footprint of Apple drive. Read/write LEDs. Fits inside drive port.
 Suggested Retail..... \$279.
Programs Plus Price..... \$219.

1-800-832-3201

Utility Software

Abbott Systems CanOpener v1.1.....	63.
Affinity Microsystems Tempo II.....	75.
Aladdin Systems Shortcut.....	46.
Stuff It Deluxe.....	63.
ALSoft Master Juggler.....	64.
Disk Express II.....	57.
American Power Conversion Power Chute.....	67.
Berkeley System Design Stepping Out II.....	49.
Caera OmniDraft or OmniSpell.....	69.
OmniProof or OmniTrace.....	105.
OmniPage.....	539.
CE Software QuickKeys or DiskTop v4.0.....	63.
MockPackage Plus Utilities.....	31.
Calendar Maker.....	31.
Central Point Software Copy II Mac v7.2.....	23.
Mac Tools Deluxe.....	75.
Dantz Software Development Retrospect v1.1.....	149.
Dayna Communications DosMounter.....	55.
Fifth Generation Systems FastBack II or DiskLock.....	106.
Suitcase II.....	43.
Icom Simulations On Cue.....	35.
Insight Development MacPrint v1.2.....	94.
Kent Marsh NightWatch v1.03.....	85.
Loop Software PictureBook.....	39.
Magic Software Backmatic.....	<i>SPECIAL</i> 50.



TURN TIME INTO MONEY!
Timeslips III by Timeslips Corp makes you more productive & profitable. Captures billable time, plus expenses. Generates custom reports and 12-month history. Creates invoices with different fee structures, then ages receivables, tracks payments. Called up instantly from inside any other program. Capacity for 2000 clients, 128 projects each.
 Suggested Retail..... \$299.95.
Programs Plus Price..... \$169.

Programs Plus

1-800-832-3201

PROGRAMS PLUS

Fax: 203-381-9043
 Inquires: 203-378-3662
 Canada: 1-800-344-7753
 75 RESEARCH DRIVE
 STRATFORD, CT 06497

& Phenomenal Prices

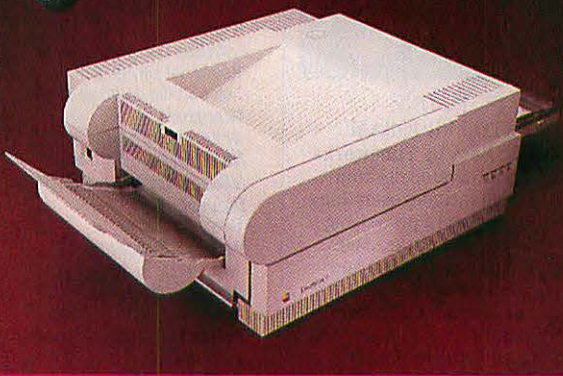


BACKING UP IS EASY TO DO!

Backmatic™ by Magic Software— Everything you need to protect irreplaceable data conveniently, quickly and automatically. You always remember: when you shut down computer, you're prompted to backup. Backs up to floppies, another hard drive or file server. Can update 80 Meg drive in under 2 minutes. Suggested Retail.....\$99.95
Programs Plus Price.....\$50.

Dubl-Click Software	
World-Class Fonts.....	42.
WetPaint.....	42.
Electronic Arts	
Studio 8 (MacII).....	295.
Studio 1.....	96.
Generic Software Generic CADD.....	83.
Graphsoft Blueprint.....	219.
Mini Cad +.....	519.
Innovative Data Design	
MacDraft v2.0.....	193.
Dreams.....	319.
I.S.I. Precision	155.
Kaetron Software Top Down v2.0.....	199.
LetraSet Font Studio.....	459.
Color Studio.....	1579.
MacroMind	
MacroMind Director v2.0.....	439.
MathSoft MathCAD.....	305.
Micro: Maps	
MacAtlas Paint v2.0.....	45.
MacAtlas Professional.....	105.
MacAtlas Presentation Pack.....	105.
Micro Spot MacInteriors.....	195.
MacPlot Pen Plotter Pro.....	259.
MacPlot Pen Plotter Standard.....	133.
Olduvai VideoPaint.....	279.
Paracomp Swivel 3D v1.1.....	295.
Model Shop.....	375.
Silicon Beach Super Paint v2.0.....	125.
Super 3D v2.01.....	315.
Strata Stratavision 3D.....	375.
Strategic Mapping MapMaker Atlas.....	289.

Win!

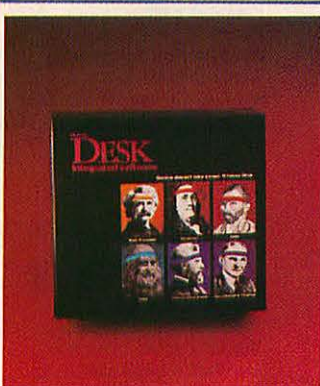


WIN AN APPLE® LaserWriter® IISC!

America On-Line • Genie Compuserve • GOPP

Graphics & Design Software

3G Graphics	
Images w/Impact Graphics.....	50.
Images w/Impact Business 1.....	65.
Abracadabra	
D.Y.O.H. Architecture.....	SPECIAL 59.
Adobe Smart Art I, II, III or IV.....	84.
Altsys Corporation	
Art Importer v2.0.....	89.
Metamorphosis.....	149.
Aapps Micro TV (MacII).....	265.
DigiVideo.....	399.
DigiVideo Color.....	665.
Ashlar Vellum.....	689.
Astral Development	
Picture Publisher v2.0.....	324.
Bright Star Technology	
Hyper Animator.....	98.
InterFace.....	249.
Broderbund Print Shop.....	35.
TypeStyler.....	115.
Claris MacPaint II.....	93.
Smartform Designer.....	289.
MacDraw II.....	289.
Claris Cad.....	579.
Computer Associates	
Crickit Stylis.....	189.
Creative Software Easy Color Paint.....	42.
Custom Applications	
Freedom of Press.....	SPECIAL 255.
Design Science ParaFont.....	59.
Deneba Software	
Ultra Paint.....	125.
Canvas v2.1.....	189.



7-In-1 DOES IT ALL!

DESK™ by Zedcor is a great bundle of savings for 7 essential applications. Includes telecommunications, word processing with spell check, database, spreadsheet with charting, B&W/color 2-24 bit paint, draw with auto trace, and personal calendar. Export/import with PageMaker,™ Word,™ Excel,™ Xpress,™ FileMaker,™ and many others. Suggested Retail.....\$399.95
Programs Plus Price.....\$229.

Studiotechnics Colorset.....	SPECIAL 229.
SuperMac Software	
Pixel Paint v2.0.....	225.
Pixel Paint Pro.....	389.
Zedcor	
DeskPaint & DeskDraw v3.0.....	115.
DeskWorks.....	225.

Accessories

Advanced Gravis	
Mouse Stick (Plus or ADB).....	69.
American Power Conversion	
110SE UPS.....	209.
370CI UPS.....	315.
CalComp Wiz Pen.....	57.
Wiz.....	149.
CoStar Labels for LabelWriter.....	11.
LabelWriter.....	185.
The Organizer.....	199.
Ergotron	
MacTilt (Mac or II) or Muzzle II.....	68.
ICD Graflex.....	84.
I/O Design	
Mac Plus Carrying Case.....	59.
Mac SE Carrying Case.....	75.
Kensington	
LaserWriter II Security System.....	32.
Apple Security Kit.....	33.
Antiglare Polarizing Filter.....	33.
Mac IIcx Monitor Stand.....	54.
Mac II Stand and Cable Kit.....	64.
Printer Muffler 80.....	43.
System Saver Mac.....	63.
New Turbo Mouse.....	109.
Two Page Display Filter.....	135.
MicroTouch Systems	
The UnMouse.....	SPECIAL 189.
Mouse Systems A+ Mouse.....	58.
A+ ADB Mouse.....	75.
Practical Solutions Cordless Mouse.....	95.

Everytime you order from Programs Plus, you're automatically entered into a fantastic drawing for Apple LaserWriter® IISC laser printer. Full-page 300 dpi. High resolution graphics and near typeset quality text. 4 fonts. A \$2800 retail value!

Rules: 1) No purchase necessary. 2) Automatic entry by purchasing from PP. Alternate entry: send name and address to Printer Drawing, Programs Plus, 75 Research Drive, Stratford, CT 06497. 3) Odds of winning depend on number of entries. 4) Drawing date on or about 12/15/90. 5) Winner notified by mail. If unable to contact winner, alternate winner will be selected by random drawing. 6) Eligibility: Contest open to U.S. and foreign residents, except where prohibited by law. Employees of PP and suppliers are not eligible. Not responsible for misdirected entries. Any tax liability sole responsibility of winner. 7) PP reserves the right to substitute prize of equal or greater value. 8) Winner's list available by written request after 1/15/91.

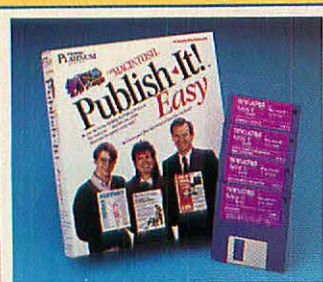
Programs Plus

1-800-832-3201



Fax: 203-381-9043
Inquires: 203-378-3662
Canada: 1-800-344-7753
75 RESEARCH DRIVE
STRATFORD, CT 06497

Over 2500 Items in Stock



**ALL-IN-ONE
DESKTOP PROGRAM**
Publish-It! Easy by Timeworks is the fully integrated desktop publisher that includes everything you need from word processing, spell checker, thesaurus, page layout, to built-in drawing and painting tools. Easy to run, but a desktop powerhouse. Requires Mac 512K Enhanced, Plus, SE, SE/30, II, IIX, Ilex, Ilei or portable. Suggested Retail.....\$199.95
Programs Plus Price..... \$112.

Word Processors & Desktop Publishing

Adobe	
Adobe Type Reunion.....	SPECIAL 39.
ATM (Adobe Typeface Manager).....	55.
Adobe Type Set vol. 1 or 2.....	58.
Type Align.....	59.
ATM +.....	109.
Adobe Illustrator w/ATM.....	275.
TrueForm Set-Up.....	225.
Newsletters or Streamline.....	225.
PhotoShop.....	499.
Advanced Software DocuComp.....	79.
Aldus Corporation	
Persuasion v2.0 or Freehand v2.0.....	329.
PrePrint v1.0.....	345.
PageMaker v4.....	499.
Altsys Corporation	
Fontographer v3.1.....	249.

7 POINT POLICY BENEFITS YOU

1. VISA or MASTERCARD accepted. No surcharge. Your card is not charged until we ship.
2. If we send a partial order, there's no second shipment charge.
3. All shipments insured at no extra charge.
4. No sales tax charged for out of state shipments.
5. COD maximum \$1,000, cash or certified check. COD orders ship via UPS Blue Label unless UPS Ground delivers next day.
6. 120-day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. Prices subject to change without notice. All items subject to availability.
7. Corporate purchases accepted,

Antic Software Flexforms 1 or 2.....	42.
Claris MacWrite II.....	145.
Computer Associates	
Cricket Graph v1.32.....	125.
Data Translation	
PhotoMac Edit.....	289.
PhotoMac.....	469.
Design Science Math Type v2.11.....	95.
Farallon Computing	
Screen Recorder.....	125.
MacRecorder v2.0.....	159.
Letraset Design Studio.....	599.
Ready Set Go! v4.5.....	275.
Letra Studio or Image Studio.....	275.
Microsoft	
Word v4.0 or PowerPoint v2.01.....	245.
New Horizon Word Maker.....	65.
Niles & Associates EndNote.....	75.
Olduvai	
Read-It! OCR v2.1.....	278.
Paragon Concepts	
Nisus v3.....	245.
Portfolio Systems	
Dynodex.....	57.
Power Up Calendar Creator.....	38.
Address Book Plus.....	99.
Fast Forms v2.0.....	115.
Preferred Publishers	
Vantage or Exposure.....	SPECIAL 52.
Prescience Expressionist v2.07.....	89.
Quark QuarkXPress v3.0.....	469.
QuarkStyle.....	169.
Shana Corporation	
Informed Mini Manager.....	80.
Informed Designer.....	167.
Mini Manager 4 Pak.....	179.
SNA Stylis I.....	55.
Spinnaker Software	
Top Honors.....	57.
Springboard Publisher II.....	107.

**Fax
203-381-9043
24 Hour**

based on credit approval. To submit purchase orders, call our business office at 203-378-1926, 9am-5:30pm EST. Shipping on corporate orders billed at cost.

SHIPPING

- **Continental U.S.** Add \$3.00 per order to cover Federal Express Standard Overnight Service, unless UPS ground delivers next day. Some areas require an additional day.
- **Order by 5:30pm EST Monday-Friday** and all (in-stock items) will ship that evening for overnight delivery, barring system failure, etc.
- **Alaska, Hawaii, outside Continental U.S., APO and FPO:** call (203) 378-3662 or write for shipping information.
- **Mail-in orders** (especially from foreign countries), please furnish telephone or fax number.



FIGHT BACK AGAINST VIRUS

Virex® by Microcom is your defense to detect and eradicate all known Mac viruses. Automatically monitors Mac to prevent infections, inspects disks, and restores files to original state. Publisher policy of fast upgrades keeps you protected. Suggested Retail.....\$99.95.
Programs Plus Price..... \$52.00. New 10-Pak for workgroups with 10-30 Macs.
**Programs Plus 10-Pack
Price.....\$317.**

Symantec More II v3.0.....	285.
Symmetry Acta Advantage.....	63.
T/Maker WriteNow v2.2.....	117.
TimeWorks	
Publish-It! Easy.....	SPECIAL 112.
Publish-It!.....	223.
Word Perfect Corporation	
Word Perfect v1.04.....	229.
Working Software QuickLetter.....	72.
Xerox Imaging Systems AccuText.....	479.

Disk Drives/Hard Disks/Keyboards

1 Meg SIMMS	79.
Cambridge MacLite Z88 160K.....	785.
CMS MacStack SD20U.....	459.
MacStack SD30U.....	499.
MacStack 44MB Removable.....	839.
DataDesk Hyper Dialer.....	32.
Vertical Function Keys.....	39.
Switchball.....	119.
MAC-101 or ADB Keyboard.....	129.
SwitchBoard.....	175.
Dayna Communications	
Daynafile DF0100 Single.....	499.
Daynafile DF0102 Dual.....	695.
Kennet Technology Rapport.....	195.
Drive v2.4 w/Fastback II.....	325.
Key Tronic	
Mac Pro Keyboard w/Tempo II.....	119.
Mass Micro Data Cartridge.....	105.
DataPak II.....	1439.
Peripheral Land	
Turbo 40MB Cartridge.....	109.
Turbo Floppy 1.44 Disk Drive.....	349.
Infinity Turbo 40 MB.....	998.

Educational/ Creative Software

Broderbund	
Jam Sessions.....	29.
Geometry, Calculus or Physics.....	58.
Carmen SanDiego World.....	29.
Carmen SanDiego Europe.....	29.
Carmen SanDiego USA.....	29.
Where in Time?.....	29.
Carina Software Voyager v1.2.....	89.
Electronic Arts	
Mavis Beacon Typing.....	32.
Deluxe Music Construction.....	84.
Deluxe Recorder.....	99.
Hip Software Corporation	
Harmony Grid.....	59.
Hook Up.....	89.
Knowledge Revolution	
Interactive Physics.....	169.
Learning Company	
Reader Rabbit or Math Rabbit.....	30.
Meta Comet	
Accu-Weather Forecasters.....	57.
Nordic	
Educational Series: (each).....	28.
PreSchool Pack.....	35.
Pelican Software	
Monsters & Make Believe.....	29.
Dinosaur Days.....	29.
Penton Overseas	
VocabuLearn Spanish, French, German or Italian, 1 or 2.....	29.
VocabuLearn Japanese 1 or 2.....	35.
Prescience Theorist.....	229.
Sunrise System Development	
SunriseGEN.....	65.



MONEY MAKER'S EDGE FOR BUSINESS

Colleague 2 by Colleague™—handles dozens of essential functions so you're more productive. Complete data base helps you follow up with customers, nail down prospects, keep appointments, organize direct mailings, track all job costs, write P.O.s and billing, keep checkbook, run financial reports. No details fall between cracks. Suggested Retail.....\$395.
Programs Plus Price..... \$319.

**Programs Plus
1-800-832-3201**

**PROGRAMS
PLUS**

Fax: 203-381-9043
Inquires: 203-378-3662
Canada: 1-800-344-7753
75 RESEARCH DRIVE
STRATFORD, CT 06497

Prompt and courteous attention to all your Macintosh needs.

**NEED
HELP?**

**1-800-
832-3201**

**Technical
Support
12 hours
a day
9-9est.**

If you need help to decide which program or product is right for you, our Technical staff can help based on your system and application needs. You benefit from almost a decade of experience serving more than 160,000 satisfied customers.

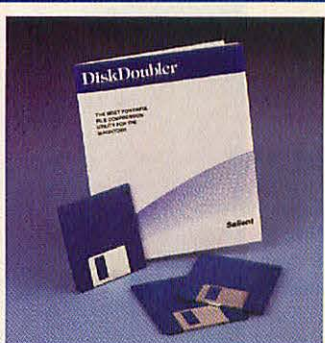
**One of the
Oldest, Most
Reliable
Mail Order
Suppliers,
Programs
Plus
Offers You the
Best Prices,
Service
& Support.**

Numbers & DataBase Management

Acius FileForce	249.
4th Dimension v2.01.....	465.
Blyth Software Omnis 5	375.
Chang Laboratories C.A.T. III v1.0	289.
Claris FileMaker Pro	219.
MacProject II.....	365.
Colleague Colleague 2	<i>SPECIAL</i> 319.
Fox Software Fox BASE + v2.0	292.
Informix Wingz v1.1	245.
MICRO PLANNING	
MICRO PLANNER v6.1.....	335.
Microsoft	
Microsoft Works v2.0.....	179.
Microsoft Excel v2.2.....	245.
Microsoft Office.....	525.
Preferred Publishers Database	68.
Satori Bulk Mailer v3.3	75.
Symmetry KeyPlan	243.
Synergy KaleidaGraph	145.
Systat Systat v5.0	619.
Festat.....	165.
Zedcor Desk	<i>SPECIAL</i> 225.

Printers, Digitizers & Monitors

Apple Computer Midi Interface	84.
Portrait Monitor.....	899.
Portrait Display Adapter.....	489.
LaserWriter II SC.....	2285.
LaserWriter II NT.....	3669.
Complete PC	
Complete Half Page Scanner.....	309.
Complete Full Page Scanner.....	759.
Digital Vision	
Computer Eyes-Mac.....	199.



AMAZING DISK SPACE SAVER

DiskDoubling™ 2.0 by Salient—Lightning quick file compression utility that increases storage capacity by up to 50 times! Compresses any file. Opens compressed files in any application. Permits 1-step expansion of Stuffit, Packit archives and joining of segmented files. 250% faster than Stuffit, saves up to 200% more space.
Suggested Retail..... \$79.
Programs Plus Price..... \$50.



MAXIMUM FAX/ MODEM PACKAGE

Maxfax by Prometheus
Products adds fax/modem capabilities to Mac. Lets you preview when fax comes in, save to standard TIFF format. Quick-FAX lets you zip off fast 1-pagers using pop-up window. Keeps phone log, schedules fax times. MacKnowledge software manages use. Auto log on to major services like CompuServe® and MCI® Mail.
Suggested Retail..... \$449.
Programs Plus Price..... \$285.

Federal Express Overnight

Computer Eyes-MacII Color.....	349.
Eastman Kodak	
Kodak Diconix M150 Plus Printer.....	489.
GDT Softworks	
Print-Link Collection.....	59.
JetLink Express.....	85.
Hewlett Packard	
H P DeskWriter w/ATM.....	879.
Koala Technologies	
MacVision v3.0 (Digitizer).....	259.
Kurta IS ADB Tablet 12 x 12	359.
Magnavox	
9CM080 Color Monitor 14".....	529.
Orange Micro Grappler 9 Pin.....	78.
Grappler LX.....	129.
Radius Pivot Display II	809.
Color Display.....	3499.
Seikosha SP1000	229.
ThunderWare	
ThunderScan Plus ThunderWorks.....	199.
LightningScan 400.....	385.

Networking

Beagle Bros. Flash.....	<i>SPECIAL</i> 129.
DataViz	
MacLink Plus/Translator.....	99.
MacLink Plus with Cable.....	119.
Farrallon Timbuktu.....	95.
TrafficWatch or Timbuktu Remote.....	123.
PhoneNET Connector (10 Pack).....	<i>SPECIAL</i> 198.
Portable Pack.....	329.
Freemsoft	
White Knight v.11.04.....	<i>SPECIAL</i> 85.
Insigna SoftPC v1.3.....	245.
Microcom Software	
Carbon Copy.....	<i>SPECIAL</i> 119.

Microsoft Mail Mac Work Station	83.
Mail Mac Server.....	245.

Nuvotech

TurboNet ST DB9 or ST Din 8.....	30.
NuvoLink II.....	279.
NuvoLink SC.....	319.
Shiva Net Serial X232.....	275.
Net Bridge or TeleBridge.....	339.

Software Venture

Microphone II v3.0.....	215.
-------------------------	------

Solutions International

MailMaker (5 user).....	117.
-------------------------	------

Fax Gate Plus.....	239.
--------------------	------

Synergy Software VersaTerm-Pro.....	174.
--	------

TOPS

Tops Repeater or Flashbox.....	118.
--------------------------------	------

Tops FlashCard.....	155.
---------------------	------

Tops Network Bundle v3.0.....	187.
-------------------------------	------

InBox/Mac Administrator.....	215.
------------------------------	------

Traveling Software

LAP-LINK Mac Connectivity.....	119.
--------------------------------	------

LAP-LINK Network Pac v3.0.....	185.
--------------------------------	------

Spelling & Grammar Checkers

Donaba Software

Spelling Coach Pro v3.1.....	125.
------------------------------	------

Big Thesaurus.....	64.
--------------------	-----

Foundation Publishing

Hyper Speller.....	29.
--------------------	-----

Lexpertise Mac Proof.....	115.
----------------------------------	------

Life Tree Correct Grammar.....	51.
---------------------------------------	-----

Microlytics Word Finder.....	34.
-------------------------------------	-----

Electronic Word Finder.....	59.
-----------------------------	-----

Reference Software Grammatik.....	51.
--	-----

Right Soft Right Writer v3.1.....	59.
--	-----

Sensible Software

Sensible Grammar or BookEnds.....	51.
-----------------------------------	-----



CONVERT B&W SCANS INTO COLOR!

Colorset by Studiotronics lets you scan color images using almost any B&W flatbed scanner and color Mac. Custom filters extract RGB color data from photos/drawings. Image enhancement toolbox to manipulate final image. Outputs TIFF, PICT formats. Includes ShowScan™ Color HyperCard Extension and Test Images. 2 Meg required.
Suggested Retail..... \$399.95
Programs Plus Price..... \$229.

Programs Plus
1-800-832-3201



Circle 44 on reader service card

Fax: 203-381-9043
Inquires: 203-378-3662
Canada: 1-800-344-7753
75 RESEARCH DRIVE
STRATFORD, CT 06497

MACWORLD Expo offers you a world of opportunity. In every corner of the world.



Wherever you find MACWORLD Expo, you'll find the opportunity to reach thousands of current and future Macintosh computer users — from Auckland to Amsterdam, Singapore to San Francisco, Toronto to Tokyo, Boston to Birmingham, and everywhere in between.

MACWORLD Expo is the original Macintosh computer show and it's still the best. It's where those in the know and those who want to grow gather to share tips and techniques... to exchange ideas... to see, try, and buy the latest in Macintosh software, hardware, peripherals, services, and more.

Don't miss out on this opportunity to appear before the largest audience of Macintosh buyers — anywhere in the world.

For information about exhibiting at any of the MACWORLD Expos listed above, mail this ad to: Mitch Hall Associates, 260 Milton St., Dedham, MA 02026. Can't wait? FAX us at (617) 361-3389.

And take advantage of a world of opportunity.

☒ **Yes** I'm interested in finding out more about exhibiting at all the MACWORLD Expos checked above. Please send me information.

Name

Title

Company

Street

City/Town

State/Province

Zip/Postal Code

Country

Phone

Fax MW9

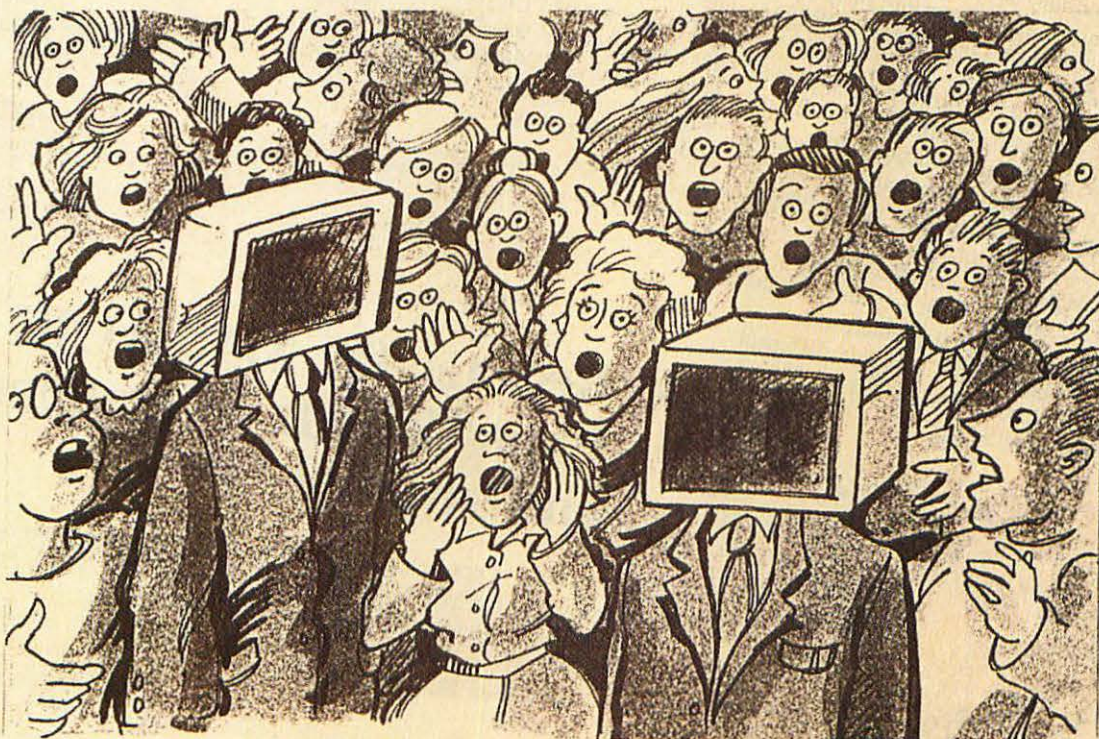
MACWORLD Expos are independent trade shows produced by World Expo Corp. and managed by Mitch Hall Associates and other companies affiliated with World Expo Corp. World Expo Corp. is an IDG company; the world's leader in information services on information technology. MACINTOSH is a trademark of Apple Computer, Inc.

When MACWORLD Expo comes to Canada, it's big news.

35 cents
(higher outside metro Toronto
and surrounding suburbs)

TORONTO POST

TUESDAY, OCTOBER 23, 1990



Fanatical and fledgling MacHeads mingle at MACWORLD Expo/Canada.

Thousands of Mac enthusiasts invade Toronto

Register now for MACWORLD Expo/Canada, October 23-25,
and save \$10-\$15.

For details, please turn the page . . .

Extra! Extra! MACWORLD Expo brings the original Macintosh computer show to Canada

Mark your calendar and make your reservations. The world's biggest Macintosh event, so popular in San Francisco, Boston and Washington, D.C., makes its Canadian debut in Toronto, October 23, 24 and 25, 1990.

Whether you're interested in networking, spreadsheet analysis, databases, multimedia, education, research, word processing, accounting, law, CAD/CAM, forecasting, design, publishing, illustration, animation, music, programming, or fun and games, you'll find it at MACWORLD Expo/Canada.

Visit hundreds of exhibiting companies spread over 100,000 square feet of exhibit space. Attend dynamic seminars and workshops run by industry experts and leading-edge users. Sharpen your Macintosh skills on the spot. And more.

Start off Tuesday and Wednesday, October 23 and 24, with Keynote Sessions by leading figures in the Macintosh industry. Then choose from six different conference tracks for every level of experience including:

- **Designer Solutions** for architects, graphic artists, engineers and advertising professionals
- **Introductory User Workshops** for those just getting started with the Mac
- **The Mac in Business** for users in large, small or home businesses
- **Programmer/Developer Forums** for veteran and novice techies
- **Special Interest Group Meetings** for users with special interests in education, healthcare and more
- **Late-Breaking/Popular Demand Topics** for those who want to get the scoop on the latest Mac developments.

Treasuries of Practical Tips — don't miss these special two-hour sessions to be held on Thursday, October 25 and filled with practical how-to's on specific programs and products.

(For a detailed conference agenda, call the MACWORLD Expo hotline in Canada at 416-742-9607.)

Register for MACWORLD Expo/Canada by September 1 and save \$10-\$15

This is your chance to pre-register for MACWORLD Expo/Canada, October 23, 24, and 25, 1990 at the Better Living Centre and Queen Elizabeth Theatre in Toronto.

Save \$15 on a full registration, including all Conference Sessions and Exhibits, by registering before September 17 (\$65 in advance, \$80 regular price.) Or pre-register for Exhibits only and save \$10. (\$12 in advance, \$22 regular price.)

Pre-registration not only saves you money, but time as well. We'll send you your admission badge early so you can walk right into MACWORLD Expo!

To take advantage of this special offer, complete the form on the opposite page and send with your payment (by check or credit card) today!

For more information, call the MACWORLD Expo Hotline at 617-361-3941 in the U.S. or 416-742-9607 in Canada.

Conference & Exposition Hours:

Tuesday, Oct. 23	10 a.m. - 6 p.m.
Wednesday, Oct. 24	10 a.m. - 6 p.m.
Thursday, Oct. 25	10 a.m. - 3 p.m.

Hotels lower rates for MACWORLD Expo/Canada

For preferred rates at one of the participating hotels listed below, call the hotel directly and mention MACWORLD Expo. Hotels include:

Sutton Place Kempinski
800-268-3790
from \$160* S/D

Delta Chelsea
800-268-1133
from \$112/S* & \$127/D*
(ref# GGLTM)

Primrose
800-268-8082
from \$90* S/D

*Canadian dollars

Register for MACWORLD Expo/ Canada by Sept. 17 and save \$10-\$15

Please choose your package and fill out this form completely. Use one form per person. (Make photocopies to register additional people.) Then send the completed form(s) along with payment to: MACWORLD Expo, P.O. Box 4010, Dedham, MA 02026. **Please do not staple check to form.**

Registration forms must be received by September 17. Incomplete forms and registrations received after September 17 will be returned. Purchase orders cannot be accepted. Registration fees are not refundable. For further information call the MACWORLD Expo/Canada hotline at 617-361-3941 in the U.S. and 416-742-9607 in Canada. U.S. and Canadian attendees will be mailed their badges on or about October 1. (Be sure to check box indicating where badge should be sent.) All other badges (non-U.S. and non-Canadian) will be held at the Pre-registration Counter at the Better Living Centre for pick up beginning Tuesday, October 23.

Please register me for:

☐ **Package One** ~~\$80~~ \$65 (U.S.)
\$90 \$75 (Canadian)

Conference sessions* and exhibits
Pre-register by September 17

☐ **Package Two** ~~\$22~~ \$12 (U.S.)
~~\$25~~ \$15 (Canadian)

Admission to exhibits only
Pre-register by September 17

Please send my badge and further information to:

Please check one: ☐ Home Address ☐ Company Address

Last Name First Name

Street Address

City, State, Zip

Country

Telephone

If mailing to company address:

Title

Company

☐ Check enclosed (make payable to MACWORLD Exposition) Amount: \$

☐ Master Card ☐ Visa ☐ American Express Amount: \$

Account # Expiration Date

(Include all numbers)

Card holder signature

(Signature necessary to be valid.)

If card holder is other than registrant, please print name below:

Last Name First Name

Cash only at the door. After September 17, you must register at the show.

Please check the appropriate boxes:

Your industry or profession

- 01. ☐ Manufacturer (non-computer)
- 02. ☐ Manufacturer (computer industry)
- 03. ☐ Distributor/dealer/retailer/service
- 04. ☐ Finance/insurance/real estate
- 05. ☐ Business services
- 06. ☐ Professional (law/medicine)
- 07. ☐ Health services
- 08. ☐ Communications/publishing
- 09. ☐ Education
- 10. ☐ Government
- 11. ☐ Consultant
- 12. ☐ Other (specify)

Your title

- 13. ☐ CEO/president/vice president
- 14. ☐ Comptroller/treasurer/accountant
- 15. ☐ DP/MIS manager
- 16. ☐ Owner/partner
- 17. ☐ Engineer
- 18. ☐ Doctor/lawyer/dentist
- 19. ☐ Educator
- 20. ☐ Art director/writer/editor
- 21. ☐ Consultant
- 22. ☐ Marketing
- 23. ☐ Sales
- 24. ☐ Other (specify)

Size of your organization (number of employees national/international)

- 25. ☐ Under 50
- 26. ☐ 50-99
- 27. ☐ 100-499
- 28. ☐ 500-999
- 29. ☐ 1,000-5,000
- 30. ☐ Over 5,000

Which personal computer(s) do you own/use?

- 31. ☐ Macintosh
- 32. ☐ Macintosh Plus
- 33. ☐ Macintosh SE
- 34. ☐ Macintosh II
- 35. ☐ Apple II Series
- 36. ☐ IBM PC (or compatible)
- 37. ☐ None
- 38. ☐ Other (specify)

*All conference sessions are on a first-come, first-served basis with no guaranteed seating.

PLEASE DO NOT STAPLE CHECK TO FORM.

**MACWORLD
EXPOSITION**
Canada, October 23-25, 1990

MACWORLD Expo is sponsored by MACWORLD, the Macintosh Magazine, an IDG Communications publication. MACWORLD Exposition/Canada is an independent trade show produced by World Expo Corp., and managed by Mitch Hall Associates and Laurentian Technomedia, Inc. and not affiliated with Apple Computer, Inc. MAC and MACINTOSH are trademarks of Apple Computer, Inc. World Expo is a company of International Data Group, the world's leader in information services on information technology.

Affordable Desktop Color!

Nothing looks better than 24-bit "True Color" on the Macintosh — except our incredible prices! No credit card surcharge and no sales tax (outside Texas) means you won't find a lower price anywhere!

Experience

From desktop color pre-press to post production video — we sell and support *everything* you need, from high resolution scanners to large color monitors.

Quality

Hardware Express sells only new, "factory fresh" equipment from major companies including Apple, Radius, and RasterOps. Every system ships complete with cables, documentation and warranty cards.

Free Bonus

Buy any Quantum hard disk with your system and we'll include a "breathtaking" collection of 24-bit color images and demo software, including MacroMind Director and StrataVision 3d — absolutely free!

Call today and put the power of color on your desktop!

Macintosh IIfx	3198
Macintosh IIfx	4398
Macintosh IIfx	5998
Apple RGB Monitor	729
Seiko 14" Trinitron	589
Apple Ext. Keyboard	169
Display Card 8-24 GC	1398
Microtek 300Z	1769
(with interface kit)	
Nikon LS-3500	CALL

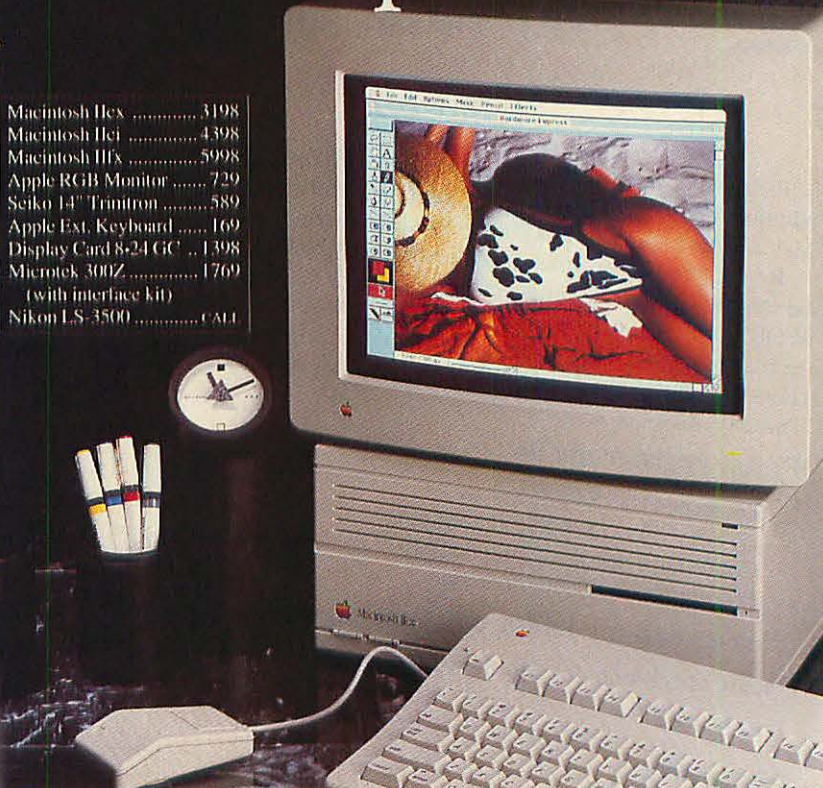
1-800/622-4739

HARDWARE EXPRESS

6800 Westgate Blvd., Suite 139 Dept. 325, Austin, TX 78745

International Calls: 512/448-1911 FAX 512/448-0825

Prices subject to change. Usually down—sorry we cannot accept American Express or purchase orders. All product names mentioned are trademarks of their respective companies. Photographs: Mac Trace © 1990 all rights reserved.



Third Wave Computing, Inc.

1826-B Kramer Lane
Austin, Texas 78758

International: 512-832-8282 FAX: 512-832-1533

Major Credit Cards; Govt., University, and Corp. POs

800-284-0486



•Quantum INTERNAL ECONOMY EXTERNAL PREMIUM EXTERNAL

40	18ms (12ms*)	Call	Call	489
80	18ms (12ms*)	Call	Call	689
105	18ms (12ms*)	Call	Call	749
120	<15ms	779	879	909
170	<15ms	899	999	1029

•Seagate MacWren (CDC/IMPRIMIS)

173	18ms	1159	1259	1289
300	16.5ms	1499	1599	1669
330	11ms Runner	1999	2099	2169
425	16ms 1/2 Ht.	2249	2349	2399
600	16.5ms	2299	2399	2469
650	15.5ms	2599	2699	2769
1000	15ms	4829	4929	4999

•Syquest, Tape, DAT, Optical

45R (Syquest)	—	629	649
45DR (Dual Syquest)	—	1249	
60t (Teac) w/Retrospect	599	629	
150t (Teac) w/Retrospect	699	729	
DATadrive™ 1.3GB WangDAT, w/Retrospect	2449		
OptiDisk 650™ (Sony) w/cart. & Retrospect	3999		

•Combo Drives

(w/Retrospect, external termination)

40/45R	1179
105/45R	1449
170/150t	1649
170/DAT	3349
173/DAT	3699
425/45R	2899
425/DAT	4499
45R/DAT	3049

•UltraCombo

(w/Retrospect, external termination)

300/45R	2499
300/150t	2449
600/DAT	4749
650/Optical	6649
1000/DAT	6999
1000/Optical	8449
2000/DAT	11199

Other combos available; call for complete price list.

•Third Wave SIMMs

with free HyperDex, installation kit

Mac SIMMs (1, 4mb)	Call
IIfx SIMMs (1, 4mb)	Call
NTX SIMMs (1, 4mb)	Call
Portable 1mb	Call
Portable 4mb	Call

Manufactured by Third Wave to the highest standards, lifetime warranty.

•Video, Monitors, Accelerators, Etc.

DayStar FastCache IIfx	699
DayStar—Full Line	Call
Orchid MacSprint II	219
PMMU w/Virtual	189
Video RAM Kit for Apple cards	39
Sony Trinitron 1304 14"	Call
Seiko Trinitron 14"	Call
Ikegami Trinitron 19" 74Hz	2599
National Semi 24bit for 19"	2299
Micron 8 Bit for SE30	Call
RasterOps 208	349
RasterOps 264-549; SE30-549	
RasterOps 364	1399
RasterOps—Full Line	Call
Radius—Full Line	Call
Microtek 300Z Color Scanner	Call
TI microLaser PostScript Printer	Call
DataDesk Keyboard	Call

Many other items available; call for complete price list.

Circle 516 on reader service card.

Professional Care

Service and Commitment...That's our Promise!

The Lowest Prices



We simply have the lowest prices in the industry. Call our bid desk for the lowest volume prices.

Corporate & Educational Accounts



Please make full use of our additional services. Call and ask for our corporate division and an account will be opened within 24 hours.

International Accounts



We ship to over 45 countries on a daily basis. We also cater to the international dealers. Please inquire about our International Dealer Plan.

After Sales Support



Our sales and service support team are here to provide solutions for all of your Macintosh requirements.

Same Day Shipping



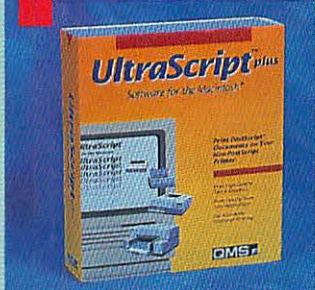
We warehouse thousands of the most exciting products. Give us a call and the items you need will be shipped immediately. In most cases you can choose the carrier to ensure delivery takes place when you need it.

Money Back Guarantees

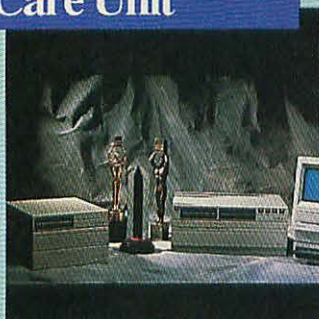


The majority of our products carry a 30 day money back guarantee. Please inquire when you order. To ensure credit please retain all original packaging.

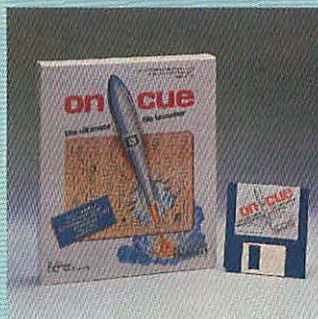
Intensive Care Unit



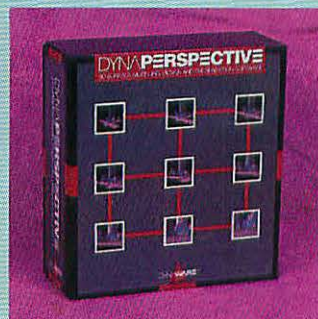
ULTRAScript™ FOR THE MACINTOSH® \$119
Now you can print PostScript® documents on virtually any laser, ink jet or dot matrix printer. The regular version includes 15 typefaces; the Plus version includes 43 typefaces and an AppleTalk™ spooler.



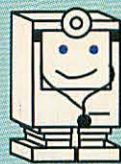
MASS MICROSYSTEMS DATAPAK 45 MEG REMOVEABLE \$888
The reliable, award winning DataPak from Mass Microsystems is the removeable asked for by name more than any other. DataPak is once again the 1990 MacWorld World Class Award winner.



ON CUE \$34
Bypass the desktop maze, eliminate "window buildup," and the frustrating wait for folders to open and close. Now with a single click of the mouse, you can go from application to application, from document to document, without accessing the Finder.



DYNAPERSPECTIVE 3D .. \$692
DynaPerspective 3D conceptual design program for powerful multi-media presentations. Enables designers to visualize and present complex 3D ideas. Unique ability to play high speed animations without pause.



DR MAC
14542 Ventura Blvd. Suite 200, Sherman Oaks, CA 91403

1-800-825-6227

USA & Canada
FAX: 818-501-3760



Call for Lowest Prices & Expert Advice.

- Mac Systems
- Pre-Press Solutions
- Networking Solutions

Dr. Mac is your Macintosh specialist...

Even our ad is designed and separated on a Mac!



DR. MAC Takes

Software

A LASTING IMPRESSION

ResumExpert	37
AATRIX	
Payroll Plus	150
Checkwriter II	35
ACIUS	
4th Dimension	469
ABRACADATA	
Design your own Home Landscape, Architecture or Interiors	55
ABSOLUTE SOLUTIONS	
Computerized Classic Accounting ..	199



Special Rx

DESIGN YOUR OWN HOME\$65
(Architecture, Interiors, Landscape)
Now you can easily design and print color plans for your dream house. Design your own Home with Architecture, Design your inside with Interiors and do your perfect exterior with Landscape.

ADOBE SYSTEMS

Adobe Illustrator '88 (incl. ATM)	269
Adobe Type Manager	55
Adobe TypeSet 1 or 2	55
Adobe Type Align	58
StreamLine	224
TrueForm	224
Photoshop	495
Fonts	Please Call

ANDROMEDA

Master Tuner	55
--------------------	----

ALDUS

Pagemaker	495
Freehand 2.0	325
Persuasion	319

ALFAGRAPHICS

Template Software for QuarkXpress, Pagemaker, Style, Ready Set Go ..	25
Claris Smart Forms	29

ALSOFT

DiskExpress II	54
Master Juggler	54

ASHLAR

AshlarVellum	695
--------------------	-----

BLTYH SOFTWARE

OmniS 5	355
---------------	-----

BRODERBUND

TypeStyle	117
-----------------	-----

CAERE

OmniPage	499
OmniSpell	68
OmniDraft	68

CE SOFTWARE

Quickmail 10 User	298
QuickKeys	64
DiskTop 4.0	64

CENTRON SOFTWARE

Casino Master	38
Casino Master Color	45



Special Rx

SMALLTALK/V MAC\$119
Smalltalk/V Mac is an object-oriented development system that is fully integrated into the Mac environment. Package includes complete tutorial and reference guide. 60-day money back guarantee.

CLARIS

MacWrite II	142
FileMaker II	209
MacDraw II (including ATM)	275
Clariscad	559
SmartForm Designer	279

COMPUTER ASSOCIATES

Bedford Simply Accounting	209
Cricket Graph	124
Cricket Paint	124

CONNECTIX

Virtual	113
Virtual with PMMU	185

CUSTOM APPLICATIONS

Freedom of Press	249
------------------------	-----

DENEBA

Canvas	185
UltraPaint	119

DIGITALK

Smalltalk V Mac	119
-----------------------	-----

DREAMMAKER SOFTWARE

Cliptures Vol 1 or 2	58
MacGallery	26

DYNABWARE

DynaPerspective 3D	692
--------------------------	-----

ELECTRONIC ARTS

Studio 8	279
Studio 1	92
Disk Tools Plus	30
Thunder II	52

EMERALD CITY SOFTWARE

SmartArt 1,2,3 or 4	82
---------------------------	----

FRANKLIN SOFTWARE

Language Master	57
-----------------------	----

FREESOFT

White Knight	81
--------------------	----

GRAPHISOFT

Minicad+	499
BluePrint	343

HELP SOFTWARE

Help for Excel 1.5 and 2.2	55
----------------------------------	----



Special Rx

**FREE MACENVELOPE with purchase of
MACPRINT (limited time only)\$94**
MacPrint lets you print Mac documents on Hewlett Packard printers. It can work on all the Laserjet and Deskjet series of printers. MacEnvelope is the premier envelope and label printing utility for the Macintosh.

HYPERGLOT

Kanjimaster	99
Word Torture Spanish, Russian, French, Italian & German	29
Verb Tutor for above languages	39
Tense Tutor for above languages	39

ICOM SIMULATIONS

On Cue	34
MacKern	58
TMON	85
HyperTMON	58
Formulator	56

INFORMIX

WingZ	238
-------------	-----

INNOVATIVE DATA DESIGN

Dreams	315
MacDraft	185

INSIGHT DEVELOPMENT

MacPrint	94
----------------	----

INSIGNIA

Soft PC	242
---------------	-----

LANGUAGE SYSTEMS

Fortran with MPW	398
Wild Things	119

LAYERED SOFTWARE

ATOnce	275
Insight Expert per module	388

LETRASET

ImageStudio	269
DesignStudio	589
FontStudio	455
ColorStudio	1568

LEXPRTISE

MacProof	104
----------------	-----

MACROMIND

Macromind Director	435
Accelerator	125



Special Rx

SOUND CLIPS\$45
Sound Clips is to MultiMedia presentations what clip art is to desktop publishing. Use them in HyperCard for special effects or to punch up a presentation.

MAGIC SOFTWARE

AutoSave II	24
BackMatic	48
POWERIcons	38

MAGNA

Empower I	119
Empower II	213

METRO IMAGEBASE

Art Deco	87
Business Graphics	87

MICROCOM

Carbon Copy Mac	115
Virex	51
Virex 10 Pack	345

MICROFRONTIER

Enhance	235
---------------	-----

MICROSOFT

Word 4.0	243
Excel	243
Help for Excel with Excel purchase ..	25
Power Point	243
Microsoft Office	522

MICROSPOT

MacInteriors	179
MacPlot Pen Plotter Pro	269

NEW HORIZONS

Wordmaker	63
-----------------	----

ODESTA CORPORATION

Double Helix	299
GeoQuery	179
Data Desk Professional	259

OLDUVAI

Videopaint	269
Read It	242
MultiClip	49

PANTONE

Process Color Imaging Guide	53
-----------------------------------	----

PARACOMP

Swivel 3D	289
Model Shop	369



Special Rx

DISKDOUBLER\$46
Expand your disk drive capacity. Fast, easy, and safe. DiskDoubler dramatically increases the storage capacity of any Mac drive. "Performance is outstanding," evaluates MacUser magazine, July 1990 (4 1/2 mice rating).

PARAGON

Nisus	238
-------------	-----

POWER UP

Address Book Plus	51
Address Book Plus with Binder	75
Calendar Creator	35
Fast Forms	86

PREFERRED PUBLISHERS

Exposure	50
Vantage	50
Database	66

PRE-PRESS TECHNOLOGIES

SpectreSeis - Quark or Pagemaker	195
SpectreScan	299

QMS

UltraScript	119
-------------------	-----

QUARK

QuarkXPress	497
QuarkStyle	166

REFERENCE SOFTWARE

Gramatik Mac	49
--------------------	----

SALIENT

DiskDoubler	46
-------------------	----

SATORI SOFTWARE

Bulk Mailer Plus	188
Project Billing	318

SENSIBLE SOFTWARE

Sensible Grammar	50
Book Ends	50

SILICON BEACH SOFTWARE

Super Paint 2.0	123
Digital Darkroom	244
Supercard	185

SOLUTIONS INTERNATIONAL

Smartscrap	46
SuperGlue II	59
The Curator	69

SOFTWARE VENTURES

Microphone II	209
---------------------	-----

SOMAK

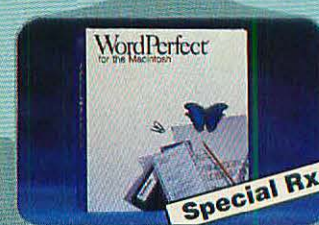
ScriptEdit	46
Sharpen Up	57
CD Rom Clip Art Vol 1 or 2	57

SPINNERAKER

Publisher II	86
Hidden Agenda	34
Sargon IV	22
Plus	111

STUDIOTRONICS

Colorset	209
----------------	-----



Special Rx

WORDPERFECT MAC\$208
Combines word processing features like parallel columns, macros and mail merge with network compatibility. Use WordPerfect with DOS, VAX DG, and UNIX.

SUPERMAC

Pixel Paint Professional	385
Pixel Paint	226
Superspool	59
Superlaser Spool	88

SYMANTEC

Think C 4.0	159
Think P	159
SAM	83
SUM II	104
More	262

SYMMETRY

Acta Advantage	64
KeyPlan	235
HyperDA	46

TACTIC SOFTWARE

ClairVoyant	45
Icon It!	45
Sound Clips	45
ArtClips	45
ArtFonts	45
FontShare	125

TEKNOSIS

HyperBasic	65
------------------	----

TELETYPESSETTING

TScript	89
---------------	----

TIMWORKS

Publish It! Mac	219
Publish It! Mac Easy	109
Hyperworks Organizer	56

TOPS

Network Bundle for MAC	179
Network Bundle for DOS	149
Network Bundle for DOS 10-Pack ..	625
TOPS Flashcard	166
Teleconnectors	26

TRAVELING SOFTWARE

LapLink Mac Connectivity Pack	111
LapLink Mac Network pack	179

T-MAKER

Write Now	115
ClickArt	From 33

VERTICAL SOLUTIONS

FastLabel	86
FastEnvelope	48

WORDPERFECT CORP.

WordPerfect	208
-------------------	-----

Corporate Medical Plans:

- Open an account within 24 hrs
- Volume Discount pricing
- School purchase orders accepted

Sale! MacLandTM

America's Largest Macintosh Hardware Source

Prices good through September 1990

Qume's ScripTEN

PostScript[®] Laser Printer

Presenting Another Unbelievable Value from MacLand

\$1,999



Qume[®]

- Ten pages per minute
- 11 Font Families (35 typefaces)
- 3 megabytes of RAM
- Solid Blacks for graphics and subtle, well-formed characters for text.
- Letter, Legal and Transparencies

Limited Quantities

To Order Call
1-800-333-3353

PostScript[®] is a registered trademark of Adobe Systems Incorporated.

Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional \$5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express

Standard Air which is 1 to 2 day service. COD's Shipped by UPS 2 day air. Call for shipping costs. Products purchased in error are subject to a 20% restocking fee. All prices subject to change without notice. All products subject to availability.

The Reasons You Should Buy From MacLand...

1. Price— Because of our multi-million dollar buying power, we purchase large volumes of quality hardware at low prices and pass the savings on to our customers.

2. Delivery— We offer **Same Day Shipping** on all in stock items if we receive your order by 3 pm Mountain Standard Time. ALL credit card orders are shipped by **FEDERAL EXPRESS STANDARD AIR** service which means you get your merchandise fast!



**Inspected & Tested
by MacLand Technician**

No. 6

3. Technical Support— MacLand has the best technical support, period. We provide you with technical support **BEFORE AND AFTER** your purchase. Best of all, to assure you the highest quality, our trained technicians test **ALL** hard disk drives for quality and viruses before we ship them to you.

Incredible Sale—Hard Disk Drives



Quantum

Quantum drives have a 2 year warranty!

	Internal	External
Quantum 40 19ms	\$ 359	\$ 439
Quantum 80 19ms	\$ 559	\$ 629
Quantum 105 19ms	\$ 599	\$ 679
Quantum 120 15ms	\$ 739	\$ 819
Quantum 170 15ms	\$ 879	\$ 949
Quantum 210 15ms	\$ 999	\$1,079



Seagate

	Internal	External
Seagate 20 32ms	\$ 279	\$ 349
Seagate 31 32ms	\$ 319	\$ 389
Seagate 46 32ms	\$ 339	\$ 419
Seagate 62 28ms	\$ 399	\$ 459
Seagate 81 28ms	\$ 429	\$ 509



IMPRIMIS Seagate WREN

	Internal	External
Imprimis 170 16ms	\$1,099	\$1,199
Imprimis 300 16ms	\$1,499	\$1,589
Imprimis Runner 330 10.7ms	\$1,825	\$1,899
Imprimis 600 16ms	\$1,999	\$2,049
Imprimis 1.2 Gigabyte 16ms	\$3,999	\$4,099

FREE Back-Up Software with the purchase of any Seagate, Quantum, or Imprimis Hard Disk Drive. **A \$199 value FREE**

30 DAY MONEY BACK GUARANTEE

ON ALL IMPRIMIS, QUANTUM, AND SEAGATE HARD DISK DRIVES

No questions asked. If you are unsatisfied with any of these drives for any reason you may return them within 30 days of your invoice for a full refund less shipping.

For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)



5006 South Ash Avenue, Suite 101 Tempe AZ 85282 (602) 820-5802



MacLand^{T.M.}



SyQuest

42 Megabyte
Removable Hard Disk Drives

\$599

FREE Back-Up Software with the purchase of any
SyQuest Hard Disk Drive
A \$199 value FREE

30 DAY MONEY BACK GUARANTEE
ON ALL SYQUEST REMOVABLE HARD DISK DRIVES

No questions asked. If you are unsatisfied with any
of these drives for any reason you may return them within
30 days of your invoice for a full refund less shipping.

SyQuest Removable Cartridges \$85

Will fit ANY 44 Removable Hard Disk Drive

Microtek 300Z Color Scanner \$1,899

Microtek 300GS Scanner \$1,469



radiusTM
Authorized Dealer



RasterOps[®]

Call for the Country's **BEST** Pricing

Laser Printers

GCC Business Laser Printer **\$2,495**
QMS PS 410 PostScript[®] Laser **\$1,999**
Qume Crystal Print Publisher I **\$2,195**
Qume Crystal Print Publisher II **\$2,695**
Qume ScriptEN **\$1,999**
Texas Instruments Micro Laser **\$1,999**

Dove 030 Accelerators

\$439

for the Mac +, SE, or Mac II

Abaton InterFax
24/96 Modem

\$379

Micron Video Boards

Xceed 640 X 480 **\$345**
Xceed 1024 X 768 **\$585**

Visa, MasterCard, and American Express accepted NO
surcharge. Your Credit Card will not be charged until your order is
shipped. We accept COD orders, additional \$5.00 charge. AZ
residents add 6.5%. All shipments made by Federal Express

Standard Air which is 1 to 2 day service. COD's Shipped by UPS
2 day air. Call for shipping costs. Products purchased in error
are subject to a 20% restocking fee. All prices subject to change
without notice. All products subject to availability.

Circle 264 on reader service card

The Lowest Prices with Technical Support, Too!

Qume®



CrystalPrint Publisher I

Brings high performance laser printing to the PostScript® environment without the high price!

\$2,195

- Five times faster than the LaserWriter IIxt
- 11 Font Families (39 typefaces)
- 3 megabytes of RAM
- Solid Blacks for graphics and subtle, well-formed characters for text
- Letter, Legal, Envelopes, and Transparencies
- 8 pages per minute

**Included FREE—Bitstream
Head Line Fonts \$195 Value**

Available for the first 100 printers sold

PostScript is a registered trademark of Adobe Systems Incorporated.



**Samsung 15"
Full Page Display
with Video Interface**

\$479

Mac Plus, SE, SE/30,
and entire Mac II family



**Magnavox 14"
Color System**

\$799

Includes Monitor and Card
For Mac II Family and SE/30



**Upgrade your Mac's
Memory**

SIMM

Sale

From \$65

Also, Ilfx and Portable Memory
Now Available,
Please call for pricing.



Ikegami 20" Color System

\$2,895

- Resolution 1024 x 768
- Vertical Refresh 60 Hz
- 72 DPI
- Latest INVAR Mask CRT Technology
- Includes Tilt/Swivel

For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)



5006 South Ash Avenue, Suite 101 Tempe AZ 85282 (602) 820-5802



20 Megabyte Hard Drive _____ \$329

Hard Drives

Beverly Hills RodeoDrives™

20 Megabyte External	\$329
30 Megabyte External	\$389
45 Megabyte External	\$448
60 Megabyte External	\$498
80 Megabyte External	\$548
100 Megabyte External	\$798

CMS External

MacStack 20 Megabyte...32 ms	\$388
MacStack 30 Megabyte...28 ms	\$448
MacStack 40 Megabyte...25 ms	\$498
MacStack 45 Megabyte...28 ms	\$528
MacStack 60 Megabyte...38 ms	\$628
MacStack 80 Megabyte...28 ms	\$728
MacStack 100 Megabyte...25 ms	\$898
45 Megabyte Removable	\$798
CMS Internal Hard Drives Available	Call

External Hard Disk Cabinets

3.5" Portable Case	\$139
5.25" Slim Line Case	\$198
Rugged Steel Construction, Shock Mounted	
Complete w/Cables & Documentation	

Tape Back-up Systems

CMS TS-60...60 Megabyte	\$648
CMS TS-150...150 Megabyte	\$798

External 800K Drive

Cutting Edge	\$149
--------------------	-------

Scanner

Complete PC Page Scanner	\$749
Hewlett Packard ScanJet Plus	\$1598
Logitech Hand Held	\$319
Microtek Series	Call

Sharp

JX 100 Hand Held	\$699
JX 300 Color	\$2999
JX 450 Color	\$4999
IEEE Interface	\$429

FAX/Modems

External 2400 Baud	\$129
Internal 2400 Baud	\$199
Prometheus M2400 FAX	\$219

Printers Dot Matrix



Seikosha **\$215**
Imagewriter/Mac Compatible

EPSON Letter Quality Printers

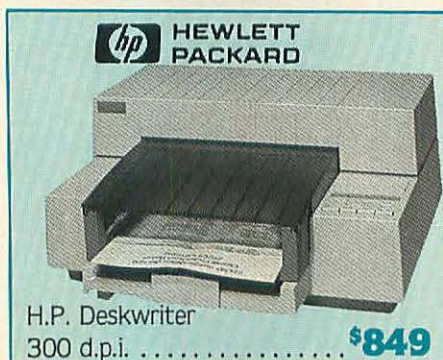
MAC LQ-510...(24 PIN)	\$399
LQ-850, LQ-950, LQ-1050, LQ-2550	Call
EPSON LQ Printer Software	\$59

Kodak InkJet

Portable M150	\$519
---------------------	-------

Olympia USA

NP 30 Apl...(9 PIN)	\$298
---------------------------	-------



H.P. Deskwriter **\$849**
300 d.p.i.

Hewlett Packard PaintJet XL	\$1995
-----------------------------------	--------

Laser Printers

EPSON EPL-6000 Laser	\$998
2 Megabyte Memory Upgrade	\$398
Freedom of the Press	
(PostScript Emulation for EPSON Printer)	\$198
GCC Technologies Business Laser	\$2998
Hewlett Packard LaserJet IIP Laser	\$1089
Hewlett Packard LaserJet III Laser	\$1698

Computer professionals since 1975.



Monitors E-Machines

Big Picture 17"	\$1198
Quickview Z-21"	\$1748
Quickview Z-21 IQ (Gray Scale)	\$2298
ColorPage 15"	\$1298
ColorPage T-16"/TX-16	\$2598/\$3098
T-19"	\$4098

Magnavox 14" Color Display

640 x 480 Resolution	\$498
----------------------------	-------

Mobius Technologies

Full page Display	\$695
Multiscreen SE	\$279

NEC MacSync 14" Color Display

640 x 480 Resolution	\$498
----------------------------	-------

Panasonic 14" Color Display

PanaSync 1024 x 768 Resolution	\$498
--------------------------------------	-------

Radius

Pivot Display	\$1398
Two Page Display 19"	\$1598
Two Page Display 21"	\$1798

Raster Ops

Clearvue Mac II Series	\$1149
Clearvue SE	\$1399
Clearvue GS	\$1599

Sony 1304 Color Display

1024 x 768 Resolution	\$699
-----------------------------	-------

Sigma Design Monitors

SuperMac Monitors & Boards

No RAD - Radiation Shields

Accelerators/Video Cards

DayStar Digital

FastCache II ci	\$749
Powercard 030, 25, 33, 40, 50 MHz	Call

Micron Video Card

XCeed 8 BIT	\$375
XCeed 8 BIT 19" Displays	\$595

Raster Ops 264/II

Other Models	Call
--------------------	------

SuperMac

SpeedCard	\$169
-----------------	-------

Keyboards

Keytronics MacPro	\$119
DataDesk Mac 101	\$129
DataDesk Switchboard	Call

1-800-426-8166

Fax Machine From Beverly Hills
(213)675-2522 (213)273-3710

279 South Beverly Drive, Suite 1200, Beverly Hills, California 90212

SHIPPING

All items in stock will ship in 24 hours. We offer daily service from Federal Express, UPS, U.S. Postal Service. Call for handling and shipping fees. Minimum shipping charge \$4.00.



• Plain and simple. Hardware: your satisfaction guaranteed or your money back.
• Software: defective software will be replaced.
Manufacturers policies prohibit us from offering refunds on opened software.

• We accept most major credit cards with no surcharge added.
• Your credit card is not charged until we ship.
• Please allow 10 days for personal and company checks to clear.
• C.O.D. orders accepted.

• We gladly accept purchase orders from most major institutions.
• International orders accepted.
• California, Texas, Georgia and Arizona residents please add the appropriate local sales tax.
• To place orders call Monday thru Friday 7AM to 6PM P.S.T.
• Prices and availability subject to change.

Circle 5 on reader service card

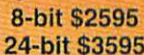
**MAC
DEPOT**™

**MAIL ORDERS AND P.O.s PLEASE CALL FOR MOST
CURRENT PRICES. CUSTOMER SERVICE & TECH
SUPPORT: 213-370-3330**

MAC EXPRESS, TO:



BLACK RIBBON, IWI	3	PHONENET DB-9	35
CURTIS CALL	4	PHONENET DB-8	35
FLAT COVERS	CALL	PLP TONER	25
FLOPPY DISK WALLET	10	QUICKNET DB-9	25
I/O DESIGNS CARRY CASE for IW II	7	QUICKNET DB-8	22
I/O DESIGNS CARRY CASE for Mac SE	49	SCSI CABLES	CALL
MAC TO HAYES MODEM CABLE	12	SONY DQ 10 PACK	29
MAC TO HQ LASER CABLE	10	SONY HQ 10 PACK	29
MAC TO IMAGEWRITER I CABLE	10	SURGE MASTER-OUTLET	27
MAC TO LASERWRITER CABLE	11	SYSTEM SAVER - PLUS	69
MAC TO MULTISYNC CABLE	17	SYSTEM SAVER - SE	69
MAC TO PC DRIVE 2.4 CABLE	375	TURBO MOUSE - ADP	25
MAC TO SONY CABLE	15	TURBO MOUSE - PLUS	105
		UPS RATHER BACKUP - SE	259



QUICK BASIC	68
QUICK KEYS	59
QUICK LOCK	59
RETROSPECT	149
S.A.M.	65
S.A.M. II	93
SCANNING RECORDER	153
SENTINEL	153
SMARTSCRAP & CLIPPER	45
SUITSACE II	44
SUPERCARD	125
SUPERGLUE	55
SUPERLASER SPOOL 5-PACK	270
SUPERLASER SPOOL	80
SUPERPOOL	55
TEMPO II	75
THE THINKER	75
THINK # PASCAL	175
VIREX	50
XTRIE	56

\$1849



CONCERTWARE+	46
CONCERTWARE+ MIDI	115
DELUXE MUSIC	85
ENCORE	350
LISTEN	62
MASTER TRACKS PRO	310
MIDI BASIC	59
MIDI PASCAL	59
MIDI INTERFACE - ALTECH	59
MIDI PACK	58
NOTEWRITER II	318
OVALTUNE	95
PERCEIVE	63
PERFORMER	343
STUDIO SESSION	69

BLUEPRINT	179	319
CANVAS 2.1	179	319
COLOR STUDIO	179	1580
CRICKET GRAPH	179	17
CRICKET PRESENTS	179	279
DESIGN STUDIO	179	627
DIGITAL DARKROOM	179	249
EASTFORM	179	89
FONT STUDIO	179	455
FOTOGRAHER	179	245
GENERIC CADD LEVEL 1	179	79
IMAGE STUDIO	179	270
MAC LABORD	179	168
MAC DRA	179	49
MACMINIDIRECTOR	179	275
MATHCAD	179	49
MINICAD	179	379
PAGEMAKER 3	179	395
PAGEMAKER 4	179	379



1. Select your products from the ad.
2. Fill out this order form.
3. Call for most current prices and availability
4. Mail this order form to:

Mac's Express Depot, 4451-B Redondo
Beach Blvd. Lawndale, CA 90260

Name	State	Zip
Address		
City		
Phone #()		Customer #
Country		

[illegible]

☐ CHECK ☐ MONEY ORDER
☐ VISA ☐ COD
☐ MASTERCARD ☐ OTHER (Specify) _____
 CREDIT CARD NUMBER _____
 Expiration Date / /
 SIGNATURE _____

CARD ORDERS: Address: Cash, Money Orders and Cashiers Checks accepted; no company or personal checks please. Shipping method is UPS Ground.

Shipping: Shipping and insurance within the continental United States by UPS Ground are included. Shipments outside the continental U.S. are available at \$7.00 per shipping class. International APO and FPO orders under \$500 accepted and shipped by USPS. Orders over \$500 by Fedex Express, Alaska and Hawaii orders - please call.

Customer Service: We have a toll-free number for all our customers. Personal checks allow up to 10 days to clear. Include name, address and telephone number (no P.O. Boxes, please). If ordering by credit card, indicate expiration date and billing address. Call for return policy.

Customer Policy: Call Customer Service at (213) 370-3363 to bring authorization. Returned products must be in original condition and packaging and be sent back within 30 days of purchase. No returns on custom items. Exchanges with unlike products are at our option and subject to 20% restocking fee.

CONDITIONS: Prices are subject to change without notice. All items subject to availability. Payment must be received before shipment. We make no guarantee for product performance. Price list expires Sept. 30, 1990.

CREDIT CARDS ACCEPTED: We accept Visa, MasterCard, American Express and Discover Cards. Please call for details. No cash advance will apply.

INTERNATIONAL TOLL-FREE ORDERING POLICIES: For orders over \$150, Orders over \$500 must be shipped by Fedex Express. For information, or to order by phone, please call (213) 370-3363. Shipping prices vary. Our credit card orders you must FAX or mail.

*Color separation of entire page done with SpectreSeps PM from Pre-Press Technologies.



STORAGE & BACK-UP



MagicTape 60
MacUser, December 1989

	Internal	External
20 megabyte	\$299	\$369
Quantum 40	\$339	\$429
Quantum 80	\$539	\$629
Quantum 105	\$599	\$689
Quantum 170	\$849	\$929
45 mb Removable		\$589
45 mb Cartridges, ea		\$73
60 mb Tape Backup w/Retrospect		\$695
150 mb Tape Backup w/Retrospect		\$795
550 mb Tape Backup w/Retrospect		\$1195
1.2 gig Tape Backup w/Retrospect		\$2995
2.4 gig Tape Backup w/Retrospect		\$3495
Magic CD ROM - Toshiba		\$749
380 mb Magic Drive	\$1295	\$1395
600 mb Read/Write Optical Drive		\$3395

MAGICSCAN 256

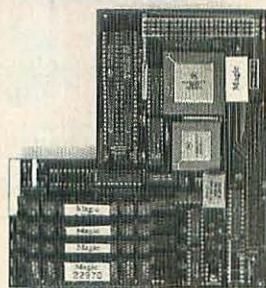


300dpi, full page, 8-bit, ImageStudio.
MagicScan 256 SALE \$999
MagicScan 256 w/Colorset SALE \$1249

UPGRADES

1MB SIMM's 70/80/100 ns	\$59
4MB SIMM's/4MB fx SIMM's	\$419/469
Portable 1MB SIMM's	\$395
1MB fx SIMM's	\$79
Magic SCSI	\$69
128K-512K Upgrade	\$149
128K-1024K (1 MB) Upgrade	\$295
512K-1024K (1 MB) Upgrade	\$149
512K-2048K (2 MB) Upgrade	\$399
512K-4096K (4 MB) Upgrade	\$499
800K Drive and ROM's	\$299
IIfx Upgrade	\$2399

030 ACCELERATORS



RailGun 16 mhz 68030 +, SE	\$499
RailGun 25 mhz 68030 +, SE	\$799
RailGun 33 mhz 68030 +, SE	\$1199

Run System 7.0 features and much more on 512, Mac Plus and SE.
 New accelerated SCSI access!

MAGICMODEM



100% Hayes Compatible - Auto Dial/ Auto Answer 2400/1200/300 Baud -	
2-Year Warranty	\$85
MagicModem V.42 MNP 5	\$199
Magic SendFax	\$119

DISPLAY SOLUTIONS

19" B&W Monitor - 2 Pg Display. 72 dpi, 78 hz. Includes card	\$899
Mac Plus Version	\$999
13" & 14" 100% Apple Compatible 8 bit color card	\$269
13" 8 bit color card for SE/30	\$329
19" 8 bit color card for Mac II series	\$499
14" NEC/MacSync w/Tilt/Swivel	\$489

SYSTEMS

IICx, 5M/Q 40, 14" color 8-bit, MacPro	\$4699
IICi, 5M/Q 80, 14" color 8-bit, MacPro	\$5769
IIfx, 4M/Q 80, 14" color 8-bit, MacPro	\$8099
Substitute Apple Monitor Add	\$359
24-bit color for MacII add	\$239

All systems and peripherals available.
 Call for configurations and best prices.

SOFTWARE

4th Dimension/File Force	469/255
Adobe Fonts	call
Adobe Illustrator 88	285
Adobe PhotoShop	505
Adobe TypeSet 1 or 2	58
Aldus Pre-Print	315
ATM/ATM Plus	59/108
Balance of the Planet	33
Freehand 2.0	315
Grolier Encyclopedia CD	229
Hunt for End October	29
Hyper Press Big Time TV	231
Jack Nicklaus Color Golf	36
Letraset ColorStudio	1489
Letraset DesignStudio	439
Mac Link + PC	119
Managing Your Money	123
Microphone II	215
MiniCad+ 2.0	449
Model Shop	379
OmniPage	545
OmniProof/Omnitrac	105
Omnidraft/Omnispell	69
Omni 5	399
PageMaker 4.0	495
Peter Norton Utilities Macintosh	79
PhotoMac Edit	289
PixelPaint Professional	385
Quark XPress 3.0	call
Retrospect	147
SAM	59
SimCity Supreme	47
SmartCACHE	59
Soft PC with AT/EGA	369
StatView II	265
Stratavision 3d	299
Suite32	call
Suitcase II	44
SUM II	93
Swivel 3D	289
Timbuktu/Timbuktu Remote	94/123
TOPS 3.0/TOPS DOS	188/165
TypeAlign	59
TypeStyler	118
White Knight	82
Whole Earth Catalog CD	84
WordPerfect	205

HARDWARE

Accelerators	
Daystar Digital FastCache Ilic	639
Dove FastNet III/SE	389
Dove Marathon 030	445
Orchid Mac Sprint	219
Micro Tech Xceed Ilic Cache	575
Co-Processors	
68851 PMMU	119
68881/82 25 MHz	99/199
68881/82 25 MHz	249/299
68882 33 MHz	399
Digitizers	
Calcomp WIZ	149
Calcomp 12 x 18 Cursor/Pen	749
Calcomp 18 x 24 Cursor/Pen	789
Computer Eyes Color	call
DigVideo Color	649
Farallon MacRecorder	159
Kurita IS/ADB Tablet 8.5x11	249
Mass Micro ColorSpace Fx	2499
Mass Micro ColorSpace III	1650
MediaTracks w/MacRecorder	329
Orange Micro Personal Vision	2119
Passport MIDI Interface	73
Umax 256 300dpi Scanner	1195
Display	
Calcomp 21" 8-bit Color w/card	4699
Calcomp 21" 24-bit Color w/card	6599
Calcomp 21" 8-bit Grey w/card	2399
E-Machines Z-21 II	1780
E-Machines ColorPage 15	1199
E-Machines T-16 Color	2489
E-Machines T-19 Color	3899
Magnavox Color 14"	489
NEC MacSync 14" Color	469
RasterOps 19" Trinitron	2999
RasterOps 264	509
RasterOps 364 Mac II	1375
RasterOps 724 19" 24 bit	5195
RasterOps IIgs	1599
Sigma ColorMax	4168
Sigma SilverView 21	1574
Emulation	
OrangeMicro Mac 86/286	519/call
Soft PC with AT/EGA	369

HARDWARE

Mice/Keyboards	
A+ Optical Std or ADB	59
Abaton ProPoint	87
Advanced Gravis MouseStick	64
CH RollerMouse	75
CE Mac105 Keyboard	119
Datadesk Mac 101 Kbd	129
Datadesk Switchboard	169
TurboMouse + or ADB	101
Keytronics MacPro	119

**"We have
over 4,500
products for
your Mac!"**

Network/Communications

Apple EtherNet Card	call
Abaton Interfax 24/96	412
Adaptec Modem-E	349
DaynaTalk	119
E-Mac SpeedLink	355
E-Mac SpeedTalk	99
Gator Card EtherNet II, SE/30	372
Hayes V Series	call
Magic 2400/2400Fax	85/119
MacMainframe II	689
Novell EtherPort II	449
Novell all models available	call
Nuvotech SCSI/Ethernet	call
Orchid MacFax	445
Phonenet Card Ethernet	435
Shiva NetModem 24	429
Shiva NetModem V32	1399
Shiva NetSerial	292
Shiva EtherGate	1599
TOPS FlashCard	155
U.S. Robotics Complete Line	call

HARDWARE

Printers	
Apple LaserWriter II NTX	4199
HP DeskWriter	825
HP Paintjet XL Color	1999
HP IIP Laser Printer	call
Kodak Diconix Jet Printer	495
Mitsubishi Color 300dpi	call
NEC Colormate PostScript	call
NewGen PS480	5839
Seiko Color	call
Seikoshia Dot Matrix Printer	210
TI Laser PostScript 35/17 2099/1749	
QMS ColorScript	7699
Qume Scripten	3195
Printer Interfaces	
Freedom Of The Press	239
GDT JetLink Express	call
Scanners	
Abaton 300S/300GS	1090/1350
Logitech Scan Man	325
Microtek MSF300GS	1529
Microtek MSF400GS	2819
Microtek 300Z w/Interface	1899
Sharp JX-100/JX-300	699/3099
Sharp JX-450	5165
Umax 256 300DPI Scanner	1295
Storage	
Bernoulli II 44 mb	1309
Dayna Single 360k	501
Dayna Single 720k or 1.2mb	579
Dayna Single 1.44mb	656
Dayna Dual 360k/720k	698
Dayna Dual 360k/1.2mb	698
Dayna Dual 360k/1.44mb	853
Dayna Dual 1.2mb/1.44mb	853
Kennet 2.4 Drive 3 1/2"	309
Kennet Mac II adaptor 2.4 drive	49
PLI Infinity Turbo	899
PLI Turbo Floppy	295
NEC Portable CD-ROM w/Interface	469
Upgrades	
800K & Rom Upgrade	299
Dove 524S/548S	239/479
Mac IIfx upgrade	2399
SE/30 upgrade	call

HARDWARE

Disks, Ribbons, etc	
60/150 Meg Tapes	22/35
American Power 110SE Ups	219
American Power 370CI Ups	350
Black Ribbons	3
DeskJests	17
Kensington Accessories	call
MacDisk Bulk (50)	0.80
Sony Boxed/Disk	13.50/0.93

ORDERING

Orders ONLY: 1-800-622-3475
 Info/Tech Supp: 1-512-343-9441
 Fax: 1-512-343-6141

Hours: 7am - 9pm, M-F,
 10am - 6pm S-S CST

Tech Support Hours:
 9am - 5pm, M-F CST

Minimum Order: \$40.00
 Prices subject to change.



Payment: Visa, MasterCard,
 American Express, Optima (no
 surcharge), company & personal
 checks, COD, & Company & Insti-
 tution PO's. Net 15. No AmEx on
 CPUs. \$10,000 max on CODs.

Tax: Texas residents add 7 1/2%.

Terms: Cards not charged
 until order ships. Returns sub-
 ject to a restocking fee.
 Shipping: \$5.00 min - All major
 carriers, and overnight.
 Leasing: Orders over \$2500/call.

UK 0800891742 • Singapore 65 287 5181 • Australia 0014 800 125353
 8303 Mopac Expressway • Suite 218 • Austin, Texas 78759 • USA • 1-800-622-3475

1-800-MAC-DISK

Circle 465 on reader service card

Portable Hard Drives

- Compact, measures only 2" x 5" x 7".
- Lightweight, under 3lbs.
- Durable 60 G shock rating.
- 110-220 volt power supply option inside drive case.
- Quiet, convection cooled.
- Fast, 12ms access.



250 MB

40 Quantum	599 ⁰⁰
80 Quantum	849 ⁰⁰
105 Quantum	949 ⁰⁰
170 Quantum	1299 ⁰⁰
210 Call	1499 ⁰⁰
250 Hitachi (July)	1999 ⁰⁰
Internal Power Supply	100 ⁰⁰
International Power	50 ⁰⁰
Carrying Case	29 ⁰⁰

Liberty
Systems

The Affordable Portable
120 Saratoga Ave., Ste. 82, Santa Clara, CA 95051

Call us today for
your free 30-day trial.

(408) 983-1127

Circle 224 on reader service card.

**PINPOINT
YOUR
PROSPECTS.**

Advertisers

interested in

renting

MACWORLD's

Subscriber List,

Please call

Kevin Normandeau

IDG List Services

1.800.343.6474

for MA 508.879.0700

**Diskette
Connection™**

NORTHEAST & CANADA

1-800-451-1849

PO BOX 10247, WILMINGTON, DE. 19850

SOUTHEAST

1-800-940-4600

PO BOX 4163, DEERFIELD BEACH, FL. 33442

MIDWEST

1-800-654-4058

PO BOX 1674, BETHANY, OK. 73008

WEST - HAWAII & ALASKA

1-800-621-6221

PO BOX 12396, LAS VEGAS, NV. 89112

Minimum Order \$20.00 NO SURCHARGE on VISA / MC
COD orders add \$3.50 Shipping charges determined by
items and delivery method required by customer.
(Prices are subject to change without notice)

FAX (405) 495-4598

VISA

SONY

3½" DS
8⁹⁵
PER BOX

3½" HD
17⁹⁵
PER BOX

*Bulk
Diskettes*

PER EA.
Min. 50

3.5" DS - **.49**

3.5" HD - **1²⁹**

maxell®

5¼" DS
5⁹⁵
PER BOX

5¼" HD
10⁹⁵
PER BOX

3.5" DS
8⁹⁵
PER BOX

3.5" HD
17⁹⁵
PER BOX

3M

Authorized Distributor Magnetic Media Division

5¼" DD
5⁹⁵
PER BOX

5¼" HD
10⁹⁵
PER BOX

3½" DS
8⁹⁵
PER BOX

3½" HD
17⁹⁵
PER BOX

FAX (405) 495-4598

Circle 79 on reader service card.

Compare Macintosh Computers System-by-System...



MAC IIx

Mac IIx, 4mb RAM, 170 mb Quantum, Apple 13" Color Monitor, 8 bit color card, Apple Extended Keyboard.

CDA	\$10,062
MacFriends	\$9,961
Texas MacExpress	\$8,529



MAC IIci

Mac IIci, 5mb RAM, 105mb Quantum, Apple 13" Color Monitor, Keytronic 105 Keyboard.

CDA	\$6,720
MacFriends	\$6,684
Texas MacExpress	\$6,129

We've made your search for competitive prices easier.

At Texas MacExpress, we have the edge.

Just take a closer look at how we compare.

Equally important, our wide range of computerware will give you a total system solution you can rely on.

Follow our prices up with unsurpassed service and the most knowledgeable technical support staff in the business, and you have a combination that can't be beat!

High Quality Products

All of our systems are fully tested and configured by one of our trained technicians. Everything Texas MacExpress sells is new from the manufacturer.

Toll-free Technical Support

Our trained staff will answer your questions and consult with you on choosing a system that best suits your needs. Also we'll help you get the most out of any of our products. Just call 1-800-MAC-STUF.

Money Back Guarantee*

If you are not completely satisfied with your purchase within the first thirty days we'll buy it back.

Worry Free Warranties

All of our systems carry at least a one year warranty. Extended warranties and on-site service agreements are available.

Leasing

Qualified businesses can take advantage of our one to five year leasing program.



MAC IIcx

Mac II cx, 5mb RAM, 105mb Quantum, NEC 14" Color Monitor, 24 bit color card, Keytronic 105 Extended Keyboard.

CDA	\$5,873
MacFriends	\$5,820
Texas MacExpress	\$5,299

MAC SE/30

SE/30, 5mb RAM, 105mb Quantum, Keytronic 105 Extended Keyboard.

CDA	\$4,225
MacFriends	\$4,075
Texas MacExpress	\$3,789

And You'll Call Texas MacExpress.

Texas Residents Add 8%
All products shipped UPS unless otherwise specified. * All products returned is subject to a 15% restocking fee. No returns on opened software.

**Texas MacExpress • 9430 Research Blvd. • Echelon 2 • Suite 250
Austin, Texas 78759 • (512) 343-0015 • FAX (512) 345-5059**

© 1990 CC Corporation. All Rights Reserved. Texas MacExpress and MAC-STUF are trademarks of CC Corp. Apple and Macintosh are registered trademarks of Apple Computer, Inc. Photos Courtesy Apple Computer, Inc.

Compare Our Hardware And Software Piece-by-Piece.



NEW UPGRADE! CORK System 030

Upgrades a Mac 512KE, Plus or SE to a fully functional IIcx or IIci:

- 68030 Processor 16mhz or 25mhz
- PMMU
- 68882 Coprocessor
- 8 mb RAM capability
- 1.44 mb FDHD disk drive
- Built-in 8 bit color
- 3 Nubus expansion slots

\$2299
25Mhz CPU only



**2400
BAUD HAYES
COMPATIBLE
MODEM**

\$69

100% Hayes Compatible with Full AT Command Set for any Computer
Busy/Ring Detect and Auto Answer • Full Two Year Warranty
Switchable between 300, 1200, and 2400 Baud

SYSTEMS

MAC IIcx

IIcx, 8mb RAM, 170mb Quantum, Apple 13" Color Monitor, 24 bit color card, Apple Extended Keyboard.

\$9,129.

MAC IIci

IIci, 8mb RAM, 170mb Quantum, NEC 14" Color Monitor, Apple Extended Keyboard.

\$6,399.

MAC IIcx

IIcx, 5mb RAM, 40mb Quantum, NEC 14" Color Monitor, 8 bit color card, Extended Keyboard.

\$4,879.

MAC SE

SE, 2mb RAM, 40mb Quantum, FDHD, Extended Keyboard.

\$2,369.

Leasing is available on all Macintosh Systems.

On Site Service Available.

MAC-STUF

HARD DRIVES

**QUANTUM PRO SERIES
2 YEAR WARRANTY!**

	Internal	External
40mb	\$338	\$438
80mb	\$538	\$628
105mb	\$598	\$688
120mb	\$768	\$868
170mb	\$848	\$928
210mb	\$985	\$1085

CDC IMPRIMIS WREN

300mb	\$1558	\$1698
330 mb Wren Runner	\$1879	\$1979
600mb	\$2298	\$2379

SONY 650 mb Optical Rewritable \$3789

Hard Drive Cases 1/2 HH
w/ power supply **\$109**

VIDEO SOLUTIONS

RASTEROPS

ColorBoard 208	\$349
ColorBoard 264	\$539
ColorBoard 364	\$1089
ColorBoard 264/SE30	\$689
ClearVue (Mac II)	\$1149
ClearVue/GS	\$1599
ClearVue SE	\$1399
19" Trinitron 8-bit	\$3969
19" Trinitron 24-bit	\$5499

OTHER MACINTOSH MONITORS

NEC MacSync Monitor	\$479
Magnavox Color Display	\$505
Sony 1304 14" Color Monitor	\$689
Seiko 14" Color Monitor	\$625
Sigma Silverview II	\$2495
EMachines T16 System	\$2549
EMachines T19 System	\$4395
Radius Monitors	call
Supermac Monitors	call

MAC-STUF

1mb SIMMs

1 mb 80ns SIMMs	\$65
256 K	\$15

PRINTERS

Qume Crystal Print	\$2459
TI MicroLaser/PS	\$2269
QMS ColorScript 100	\$7699
LaserWriter IIxt	\$3279
LaserWriter IIxk	\$4279
HP DeskWriter	\$835
HP LaserJet III	\$1705
HP LaserJet IIP	\$1045
GCC PLP II	\$1249
GCC BLP	\$2799
GCC Write Move Printer	\$499
Kodak Diconix Ink Jet Printer	\$489
Seikosha ImageWriter I Clone	\$199

SCANNERS

MicroTek 300Z	\$1789
MicroTek 300GS	\$1529
MicroTek 400GS	\$2639
Sharp JX-100	\$719
Sharp JX-300	\$3099
Sharp JX-450	\$5165
Abaton Scanners	call

ACCELERATORS

NOVY Quik 030 \$599.00
030 16mhz - 25mhz Power For the 512ke, and Plus.

AppleSuperDrive (FDHD) \$149

ExpanSE/30

\$995

Second Wave Expands your SE/30 to a IIcx by adding 4 NuBus Slots so you can utilize inexpensive Mac II peripherals.

SOFTWARE

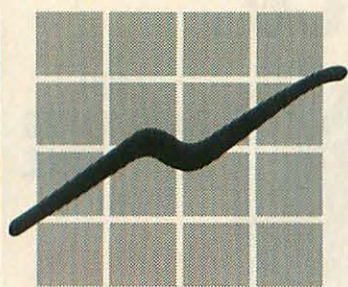
4th Dimension	469
ATM	56
ATM Plus	108
Adobe Fonts	call
Adobe Illustrator 88	279
Adobe Photoshop	502
Adobe TypeSet 1 or 2	58
AfterDark	22
Canvas	185
DOS Mounter	54
Freehand 2.0	309
Grammatik	50
Image Grabber 2.0	39
Letraset ColorStudio	1489
Letraset DesignStudio	439
MS Excel 2.2	249
MS Office	525
MS Works	179
MS Word 4.0	249
Mac Link + PC	119
Mac Money	58
Managing Your Money	123
Microphone II	215
MiniCad+ 2.0	449
Model Shop	374
OmniPage	545
PageMaker 4.0	495
Persuasion	335
Peter Norton Utilities	69
Pixel Paint Professional	385
Quark Express 3.0	499
Quicken	34
Retrospect 1.1	149
SAM Virus Protection	59
Statview II	265
Soft PC	225
Suitcase II	44
SUM II	95
Swivel 3D	289
Timbuktu	94
TOPS 3.0	188
TOPS DOS	165
TypeStyler	118
White Knight	75
WingZ 1.1	249
WordPerfect	205

We Accept these Cards
with no Surcharge.



1-800-MAC-STUF

Circle 442 on reader service card



MacTel
Technology Corp.

Contact the professionals at MacTel Technology. We handle only the best in Macintosh hardware, systems and peripherals. Names like Apple, Nikon, Radius, RasterOps, Daystar, PLI, Sharp and our own, top-quality Index brand.

We provide services such as international sales, service and banking; competitive system quotes; our own research and manufacturing facility; and qualified, reliable technical support (before and after the sale.) It's no wonder that the vast majority of our business is repeat business.

Call or fax with your hardware or system requirements. We'll show you why there's no better solution than a professional solution from MacTel Technology Corporation.

Professional

Index Hard Drives

All hard drives come with Auto-Sensing Power Supply.

	Internal	External
Quantum 3.5" ProDrive HD - 12ms 2-Year Warranty		
40Mb 12ms	\$359	\$479
80Mb 12ms	\$569	\$699
105Mb 12ms	\$615	\$775
170Mb 12ms	\$889	\$999

Imprimis 5.25" Wren Series HD - 15ms		
180Mb 15ms	\$1099*	\$1199
300Mb 15ms	\$1499*	\$1599
330Mb 10.7ms	\$1899*	\$2025
600Mb 16ms	\$1999*	\$2250
*fits only Mac II, IIx and IIcx		

Syquest

Removable Hard Drive with 44Mb cartridge.....	\$669
44Mb cartridge.....	\$75

A MacTel Special Seagate 20 Mb Internal Drive

28 ms • complete with MacTel software package • 2-year warranty.

\$279

All MacTel Hard Drives, Syquest drives, and Sony optical drives include the MacTel Software Package valued at over \$200...

**Absolutely
FREE!**

Includes:

- Partitioning Software - True partitions; A/UX and MOS partitions
- Password protection - secure files.
- Disk Caching - faster access times.
- Disk Mirroring - file cloning
- Backmatic - automatic backup.
- AutoSave II - protection against data loss.
- 10 Mb of public domain software.

Backmatic and Autosave II are registered trademarks of Magic Software, Inc.
All prices subject to change



**Put together the system of
your dreams with MacTel!**

Introducing the Texas Instruments

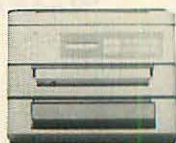
Ti microLaser

Ti microLaser PS35
with 35 fonts.....\$2995

Ti microLaser PS17
with 17 fonts.....\$2495

AppleTalk connector included!

Ti microLaser (w/o
AppleTalk & PS) \$1599



The first truly personal
Adobe PostScript®
Laser Printer

1 • 800 • 950 • 8411

Telephone: 512/451-2600 • Fax: 512/451-3323 • Technical Support: 512/458-2222

MacNet: MACTEL • Australia: 800/125-880 • United Kingdom: 0800/89-1428

Europe: 0041/46-054020 • 3007 North Lamar Road • Austin, Texas 78705

**Call or fax
For a MacTel
COMPETITIVE
SYSTEM
QUOTE!**

Solutions From MacTel.

Hardware

MacTel hardware

MacTel Extended Keyboard
ADB Eng./German.....\$109/\$119

MacTel-NET

(100% Phone-Net®
Plus compatible)

\$18

Index Modem 2400 baud external
(100% Hayes compatible).....\$99

Kensington

Turbo Trac Ball Mouse ADB..\$169

Printers

TI microLaser Printers

PS35 w/35 fonts.....\$2995
PS17 w/17 fonts.....\$2495
AppleTalk Connector included!

Macintosh CPU's

• Macintosh IICX, CI, & NEW Mac
IIFX • Mac II FX logicboard
upgrades and more
*Always available. Call for the
absolute lowest price
anywhere!*

Sony

600Mb Removable
Optical SCSI Drive.....\$3697
Optical Cartridges.....\$268

Syquest

Syquest Cartridges.....\$75

RasterOps

*We carry the complete
RasterOps product line -
Call for the lowest price!*

• ColorBoard208 • ColorBoard 208
V-RAM Upgrade • Colorboard 264
• Video ColorBoard 364
• ColorBoard 708+ 19" system
• Color Board 724 System + Trinitron
Monitor • ClearVue/GS System for
SE/30 • 8L Sysytem • 24L System

Microtek Scanners

MSF 300 GS, including cables and
software.....\$1745
MSF 300Z ColorScan, including
cables and software.....\$2195
MSF 400 GS.....\$2945

Abaton

Interfax Modem 12/48.....\$349
Interfax Modem 24/96.....\$499

Software

Adobe

Adobe Photoshop.....\$599

Microsoft

Microsoft Office.....\$599
Microsoft Excel.....\$279
Microsoft Word 4.0.....\$279

Quark

Quark Xpress.....\$795

Aldus

PageMaker 4.0.....\$569

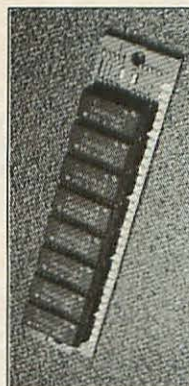
Index Memory Modules

1 MB Surface Mount, Low Profile

\$59

• 80ns/70ns SIMMs • Gold contacts
and traces • Lifetime warranty

4Mb Surface Mount/Low Profile (80ns)\$369
Macintosh FX & LaserWriter NTX SIMMS\$69
4 Mb Mac IIx Upgrade\$450
INDEX Macintosh Portable RAM
3 Mb Portable Upgrade\$1295



OVERNIGHT DELIVERY AND VOLUME DISCOUNTS AVAILABLE!

The Index Portrait

15-inch,
monochrome
portrait monitor
with tilt-and-
swivel base.
Includes
interface card
for the Mac SE,
SE/30 or Mac II.



\$625

Call for the lowest price! Attention Corporate Clients: our quotes are competitive - call or fax now!

Ordering information



• No surcharge for Visa or MasterCard. Add 4% for American Express. Your credit card will not be charged until your order is ready to ship. International orders call or fax for details. European banking service available. • Purchase orders accepted from university, government, military NET 30 and corporate (on approval), NET 30. • Please allow 10 days for personal and company checks to clear. • Returned merchandise must be authorized to expedite process, call 512/451-2600 for RMA number. • All defects will be replaced or repaired at MacTel's discretion. • Shipping and handling charges not refundable. • Product must be in original condition and original shipping container including all packing materials. • All products are subject to a 5% restocking fee. • Prices subject to change without notice and all products subject to availability.

**MacTel Technology Corporation carries
the entire Apple Macintosh line - call for the
absolute lowest price anywhere!**

Professional Solutions For Today's Macintosh Professional.



mactel
TECHNOLOGY CORPORATION

Circle 142 on reader service card

POWERFUL
by Design.

AFFORDABLE
by Comparison.



Who says you can't get solid performance and low price at the same time? With **POWERDrive** it's not only possible - it's guaranteed. **POWERDrives** have been designed to be reliable, quiet, fast and super easy to install. And no matter which **POWERDrive** you choose, you can be sure you're getting the best value on the market today. If you don't agree, we'll give you your money back. It's that simple.

POWERDrive The **POWER** of Choice.

What's more, Hard Drives International donates a portion of each sale to charities that help save our environment.

Give us a call. Find out why so many people are making **POWERDrive** their "Power of Choice". We think you'll be surprised at how much you get for so little.

Capacity in Mbytes	Mechanism	Access time in milliseconds	External price \$	Internal price \$
20	Seagate	40	299	259
30	Seagate	40	339	289
40-45	Seagate	40	379	329
	Quantum	19	429	379
60	Seagate	28	429	409
80	Seagate	28	479	469
	Quantum	19	619	599
105	Conner	23	629	549
	Quantum	19	679	619
200	Conner	16	1,059	949
320	Micropolis (HH)	14	1,599	NA
	Imprimis (FH)	16	1,499	NA
600	Micropolis (FH)	16	2,295	NA
	Imprimis (FH)	16	1,999	NA
1050	Imprimis (FH)	16	3,999	NA

Removable SyQuest	25	\$599	NA
Complete with one 45Mb removable cartridge.		Extra Cartridge \$79	

(800) 776-DISK

U.S. & Canada

3 4 7 5



1912 W. Fourth Street • Dept. MA • Tempe, AZ 85281
Sales: (602) 967-5128 FAX: (602) 829-9193 • Int'l. Sales: (602) 350-1144



Price/availability subject to change. All items are new. P.O.'s accepted from qualified buyers NET 20 (some conditions may apply). VISA/MC/AMEX. 30-day Guarantee conditions: Shipping/Handling charges not refundable; product must be in orig. condition. \$13 Military APO/FPO Express delivery (602) 350-1145. Hard Drives International is a division of Insight Distribution Network, Inc. All trademarks and trade names are properties of their respective owners. ©1990 Insight Distribution Network, Inc. KA990



To pick this up for \$2,645 just pick this up.



We've got it all.

Hardware, software and systems. From Apple, RasterOps and Microsoft, just to name a few. In fact, we have over 6,500 items for all your computer needs. Quantity discounts. And prices that leave the other guys guessing.

At the lowest prices.

Just thumb through this magazine until something catches your eye. Then call us for a price on the same item. Even after you add the cost of your phone call at \$2/minute you'll still get the lowest price anywhere.

It's no-risk. Guaranteed.

On top of our lowest price, best selection offer, we've got a guarantee that will settle the deal. A generous 150 day return on most hardware and software. So, if it's not just what you need, send it back. You'll get a refund, no questions asked.

So call us.

Just say go. We have \$160 million of inventory in 16 warehouses worldwide. So we can ship your order immediately. Call us anytime Monday through Saturday, 8 a.m. to 10 p.m. (CST) to order, or even if you're just curious. You'll find out that getting the best price on hardware, software and peripherals from people that really know Macintosh, is as easy as picking up the phone.

Payment: Visa, MasterCard (no surcharge), checks, COD's, and Company and Institutional PO's. \$6,000.00 maximum on COD's.
Tax: Texas residents only add 7.75% sales tax. **Prices** and items are subject to change and availability. **International:** 5% surcharge on international orders. **Mail In:** Orders accepted with \$10 surcharge.
Terms: You are not charged until your order is shipped. **Shipping:** Minimum \$5.00 — UPS Ground, Blue, Red, Federal Express, Emery, Airborne, US Mail. Returns must be in original condition and package. Seal must not be opened on software. Returns may be subject to a restocking fee. Ask for details when ordering. **Bottom Line** Distribution cannot be responsible for errors in typography or photography.



Fax: 1-900-420-8770

International Fax: 512-469-5678

2021 Guadalupe, Suite 30 • Austin, Texas 78705

SYSTEMS

Mac SE	1745
Mac SE 30	2645
Mac IIcx	3259
Mac IIci	4395
Macintosh Portable	call
Mac IIlx	6499

HARDWARE

RasterOps 264/364	499/1335
All RasterOps products available at lowest prices	call
SIMM's: all types/best prices	call
AAPS MicroTV Professional	349
Apple ImageWriter II	415
Apple LaserWriter II NTX	4199
Abaton Interfax	251
Big Picture Z21 SE	1589
Big Picture Z21 II	1659
Big Picture Z21 IQ	2310
ColorSpace Ili	1449
Courier 9600 V-32 MNP5	659
Datadesk Mac 101 Keyboard	123
Datadesk Switchboard	159
Dove Fax 24/96	263
Dove MacSnap All Models	call
E-Machines T16	2350
E-Machines T19	4100
FastNet III/SE	344
Hayes Smart Modem 2400	325
Hewlett Packard Printers	call
Mac 286	995
Mac Irma	684
Mac Recorder Digitizer Only	89
Magnavox 14" Color	469
Marathon 030/030x	423
Microtek 300Z	1699
Motorola PMMU 68851	109
NEC Monitors - all models	call
Novy Quik-30 Accelerator	799
PhoneNet Star Controller	739
PhoneNet 10 Pack	188
Practical Peripherals 2400b	164
Practical Peripherals MacPak	225
Quick Mail 10 User	285
Qume CrystalPrint	2895
Scanman 32	313
Sharp Scanners All Models	call
Silverview S4/S8	1660/1995

Sony DSD/DSHD	11/21
TI MicroLaser Printer	2050
Timbuktu/Remote Access Pk	732
Turbo Mouse 3.0	101
TurboStar	1149
Zoom 2400baud Modem	99

DRIVES & TAPES

Bernoulli 45 mb Removable	1209
CMS 20 EXT/30 EXT	387/442
CMS 60 EXT	591
CMS Tape 60/150	599/799
Cutting Edge all models	call
DaynaFile 360K	424
DaynaFile 360K/ 1.2Mb	589
Irwin 40 mb/80 mb Tape	799/969
PLI Infinity 40 Removable	876
PLI TurboFloppy 1.4	273
Quantum 40 mb/80 mb	309/509
Quantum 105 mb/170 mb	569/829
Syquest 44 mb Mechanism	449
Syquest 44 mb Cartridge	71
Internal/External Drive Kit	29/99

SOFTWARE

4th Dimension	452
AccuText	485
Adobe Fonts	from 56
Adobe PhotoShop	485
at Once!	273
Can Opener	57
Canvas 2.1	172
Carbon Copy 2 Pack	153
Cricket Presents	280
Double Helix 3.0	303
Dreams	282
Fastback 2.1	97
Filemaker II	181
Fontographer 3.0	225
FoxBase + Mac	265
Freedom of Press	229

Freehand 2.0	297
FullWrite Professional	237
GOfar	40
Insight Expert Accounting	355
Just Enough Pascal	47
Letraset Color Studio 1.0	1389
Letraset Design Studio	541
MacDraw II	241
MacInTax	63
Macromind Director	395
MacWrite II	125
Managing Your Money	113
Master Tracks Pro	183
MathCAD 1.0	264
Mathematica SE	429
MS Word 4.0/Excel 2.2	225/225
MiniCAD+	439
Model Shop	340
Norton Utilities Macintosh	67
OmniPage	496
PageMaker 4.0	485
Pixel Paint Professional	356
QuarkXPress 3.0	439
Quick Keys	57
Ready Set Go	252
Retrospect	125
Simply Accounting	201
Soft PC	215
Studio1/8	85/269
SuperCard	114
Think C	153
Think Pascal	93
TOPS 3.0 Network Bundle	172
UltraPaint	115
Vellum	599
Virex	46
Virtual 030	114
White Knight	75
WingZ	235
WriteNow 2.0	111

BOTTOM LINE

DISTRIBUTION

1-900-420-3636

Mac mail order will never be the same.

\$2 PER MIN

MACWORLD

PRODUCT LAUNCH

SECTION

Turn to the Product Launch Section of Macworld for information on the new products in the Macintosh industry.

This is the premiere showcase for new product launches or relaunches. Look to the Macworld Product Launch section—your source for the newest Macintosh products.

**Call your account executive
for more details on advertising
in the Macworld Product Launch section!
(415) 243-0505**

The only radiation-free computer monitor in the world!

as seen on CBS Evening news
with Dan Rather.

The Problem: "... magnetic field emissions, which have been linked for more than ten years to the development of cancer. ..." MACWORLD (7/90)

Non-Solutions: 1) Sitting back. Time Magazine warned: "... sit at least ten feet away from the television set." This is impractical with computers! VLF radiation extends 10 feet.

2) Buy a shield to slap in front of the monitor. MACWORLD reported: "Smart money says it's a low frequency magnetic field problem and screens don't take care of the magnetic field."

The Solution: The Safe Monitor. "Since all other VDTs emanate electric and magnetic radiation, and may generate X-rays if malfunctioning, it is fair to call the Safe Monitor a breakthrough, since it emits no radiation." J. Anderson, Atlantic Nuclear Corporation.

"I've been using the Safe Monitor and find it a lot more comfortable, gentle and pleasing on the eyes than CRTs." Dr. Natalie Greenman, Optometrist.

"... our tests confirm the Safe Monitor generates virtually no emissions." MACWORLD.

The Safe Monitor is used at the E.P.A., the U.S. Congress, and Yale Medical School. It works great with all MAC systems. You have to demand safe equipment from your boss or face cancer and leukemia risks!

ALSO ... Test your own computer monitor! Our hand-held Gauss meter shows you the safe distance. Measures radiation going through your body. Call Vicki Burnham for information at (617) 444-7778.

Safe Computing Company

368 Hillside Ave., Needham, MA 02194

Clip and reproduce this historical ad.

Circle 517 on reader service card.

Remember your Future!



Missed appointments are history with Smart Alarms and Appointment Diaries.

This program will remind you any time with on-screen display and selected sounds. It's a self installing INIT, with auto backup and variable 3 hour snooze. It has print, import, export, merge Reminders and can be turned off during selected applications. Single user version is available. Multi-user version works on TOPS, AppleShare, allShare & PSN.

JAM Software

VOICE 415/663-1041 FAX 415/663-8217

Int'l Sales: Australia Int+ 612/799-1888 FAX Int+ 612/799-4042

V3.0

Circle 21 on reader service card.

Backup Automatically...

Imagine a backup program that backed up everything that you did everyday. A program that you never had to remember to use. It just worked automatically. That program is **Backmatic** from **Magic Software**. Backmatic will automatically backup your new or changed files to your floppy drive, hard disk, or network server when you shut down. Backmatic can also backup at preselected times, like noon and 5:30 everyday or on Tuesdays at 4 a.m. Backmatic is perfect for the individual Macintosh user, essential for the networked group, and ideal for Macintoshes that never shut down (like file servers.) Backmatic... because without it... backing up is hard to do! **Backmatic** is just \$99.95 for a single user. 5 and 10 user packs and site licenses are available. For more information, see your local dealer or contact us directly.

Magic Software, Inc.

2206 Franklin • Bellevue, NE 68005
800-342-6243 • 402-291-0670

Circle 225 on reader service card.

REVOLUTION

JOIN THE CD-ROM

EDUCORP STOCKS THE LARGEST COLLECTION OF CD-ROM TITLES

Denon DRD-253 Drive*

The Denon CD-ROM drive is packed with features. It includes a built-in speaker, RCA jacks, and software for listening to audio CDs. The unique sleep mode assures longer life. One-year warranty. Our best-selling CD-ROM drive.

#1317, \$699



Toshiba XM-3201 Drive*

The Toshiba XM-3201 CD-ROM drive for Macintosh computers is the performance favorite. It's the fastest of all CD-ROM drives (MacUser 3/90). Automatic adjustment to U.S. or European power. One-year warranty. Rated 1/2 by MacUser Magazine. #1391, \$799

* SCSI cable included. Specify (#982) SCSI to SCSI or (#981) Mac to SCSI cable. IBM PC/compatible interface kit available (please call).

EDUCORP CD-ROM 4.0

Over 620 megs of the finest public domain/Shareware software. Includes 1000s of utilities, 100s of laser clip art and fonts, 150 megs of stacks, 100s of fonts, 100s of games, and much more. Our user interface guides you through over 10,000 files. Preview pictures, fonts, and sounds at the click of a mouse. The best! #1300, \$199
Denon & CD-ROM 4.0 #1318, \$849
Toshiba & CD-ROM 4.0 #1392, \$949



Exotica-ROM™

The first Mac CD-ROM dedicated to a single artist's work. This features exotic art painted by the world-famous artist Olivia. 100 paintings scanned in brilliant color (24-bit & 8-bit), grayscale, and b/w. Available on floppies (ask) #1-1327, \$199 MAC & PC

Lingua-ROM™

Learn to speak Russian, French, Spanish, German, Japanese, Italian, and Chinese. Includes extensive sound to help with pronunciation. The Lingua-ROM contains 25 of HyperGlot's language tutors (over 130 disks) on one CD-ROM. Tutors include: Word, Verb, Noun, Grammar, Pronunciation, and many quizzes #1358, \$499

Sports-ROM™

An incredible collection of sports images as clip art for your Macintosh. All files are in the TIFF format. These clips were specifically designed to produce excellent, well-defined lines and tonal definition using 300 dpi printers. Schools and institutions that host sporting events are seconds away from professional-looking flyers and presentations. The Sports-ROM includes a wide variety of images: football, baseball, basketball, soccer, archery, badminton, golf, gymnastics, tennis, track and field, volleyball, rugby, ping-pong, team handball, and more. #1359, \$69.95



Other CD-ROMs

Education	Price
1204 Learn to Speak French	\$199.00
1354 The Magic Flute	\$9.95
1347 Beethoven's Symphony #9	\$9.95
1383 Beethoven String Quartet #14	\$9.95
1348 The Voyager CD Audio Stack	\$9.95
1344 Vietnam Remembered	\$9.95
1340 U.S. Civics	\$9.95
1341 The World Fact Book	\$9.95
1325 The Whole Earth	\$129.95
1345 Officer's Bookcase	\$119.95
1369 The Best of MacTutor	\$219.95
1310 Webster's Dictionary	\$179.95
1309 Electronic Map Cabinet	\$179.95
1333 Grolier Encyclopedia	\$295.00
1368 Place-Name-Index	\$549.95
1336 Guinness World Records	\$99.00
1305 Time Table (Xyphias)	\$129.95
1575 Facts on File	\$720.00
Discs Books (Education for kids)	
1552 The Tale of Peter Rabbit	\$74.95
1553 The Tale of Benjamin Bunny	\$9.95
1557 Thomas' Snowsuit	\$64.95
1558 Mud Puddle	\$64.95
1559 The Paper Bag Princess	\$9.95
1551 Cinderella	\$9.95
1555 Scary Poems for Rotten Kids	\$74.95
1554 A Long Hard Day on the Ranch	\$9.95
1556 Heather Hits 1st Home Run	\$74.95
1560 Mvng Gives Me Stomache Ache	\$74.95



Business

1337 Microsoft Office	\$559.95
1304 National Directory	\$149.95
1386 CD-ROM Developer's Lab	\$599.95
1387 Z-CR	\$899.00

Desktop Publishing

1338 TypeVendor	\$179.95
1366 Drkrm Clip Photography	\$299.95
1367 ArtRoom	\$599.95
1300 EDUCORP Clip Art	\$59.95
1342 Quick Art	\$189.95
1308 ProArt V.1	\$299.00
1335 ProArt V.2	\$299.00
1328 The Inhouse Complete	\$699.00
1307 Kwikiee In-House Pal	\$99.00
1343 Government Seals	\$59.95
1324 Comstock V.1	\$299.00
1329 Comstock V.2	\$129.95
1359 Sports-ROM	\$69.95
1572 NEC Clip Art 3-D	\$269.95
1573 NEC Type Gallery	\$269.95

Miscellaneous

1365 Desktop Sounds V.1	\$99.95
1363 Digital Sounds Series V.1	\$299.95
1364 Digital Sounds Series V.2	\$299.95
1388 MediaTracks Multimedia	\$349.95
1574 Archive I CD-ROM	\$89.95
1326 Alltop's Compact Disk Cleaner	\$9.95
1349 CD Laser Lens Cleaner	\$19.95
1322 Modular Organizer	\$4.95
1321 CD-ROM Caddies	\$12.95

Buy 4 CD-ROM titles and we'll give you four CD Caddies FREE! #1399

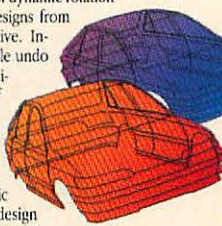
BOOK DISKS PACKED WITH SOFTWARE

INDIVIDUAL DISKS ONLY \$6.99 EACH

Buy 5 for \$5.99 each, or BUY ALL 10 DISKS FOR \$49.90 (ONLY \$4.99 EACH)

4414 CompuGraph

This disk contains a full, working 3D graphics program. Sophisticated enough for engineers and designers, yet simple and versatile enough for artists. You'll be able to control dynamic rotation and view designs from any perspective. Includes multiple undo levels and animation of design. With multiple design levels, you can modify specific areas of your design with accuracy and flexibility using a range of commands. #699



2128 Essential INITs

Contains MacPassword for file security, Vaccine to prevent viral infections, INIT CDEV for turning INITs on and off, and 10 other very useful INITs #699

3012 Laser Fonts

This disk contains 11 of our high-quality laser fonts. Included are three types of the Classical font, Miami Nights, and three script fonts, including Style, a very popular laser font #699

4601

SoundMaster

A brilliantly-crafted Control Panel Device (CDEV) that allows you to change your Macintosh sounds: startup, restart, beep, disk insert/eject, shutdown, and more. Includes some excellent sounds: Cartoons, Hitchhiker's Guide 1 and 2, and much more #699

5817 Startup Screens

Tired of the same old "Welcome to Macintosh" message every time you turn on your Mac? Now you can install a selection of 29 terrific startup screens to liven up your Mac #699

2129 CIGN Editor/ResEdit

Lets you edit and manipulate all resources, from icons and dialog boxes to menus. Includes resource templates, samples and help files. Also includes a great color icon editor #699

2122 Virus Stompers

Always contains the latest version of Disinfectant. It can detect the new WDEF virus. Also provides 11 other great virus detection programs #699

4271 Board Games

Backgammon, 3D Checkers, Pente, and 10 more great board games are included on this disk. Many allow you to play against the Mac! #699



4275 Strategy Games

Artillery, Mystery Box, HexPuzzle, Chinese Puzzle, Maze 3D, and Mines are 6 of the 10 classic strategy games on this disk #699

7204 Clip Art Stack

A large collection (over 490 images) of high quality bitmapped clip art from the inventor of HyperCard, Bill Atkinson. Great for layouts and designs! #699

FIVE-DISK SETS

Best of Games v.1

Five 800K disks containing 31 of our best games. Includes board games, card games, and adventure games. Many offer the option to challenge your Mac or a friend. Favorites include Billiard Parlor, Cross-Master, Crystal Raiders, Cap'n Magneto, and more #1151, \$24.95

Best of Clip Art v.2

This set contains over 120 clip art pictures of animals, computers, office signs, and more. Over 35 EPS files that print in high resolution on postscript laser printers when used in any page layout program #1166, \$24.95

Best of Education

Five 800K disks containing 60 of our best educational programs. Includes math and science programs, educational games, teacher's aids, and a dozen kids programs for children just starting to use the Mac #1155, \$24.95

Best of Laser Fonts

Five 800K disks containing our newest and best laser fonts. Includes headline fonts, designer fonts, text fonts, and much more. This set will really help you dress up your ads, letters, and page layouts #1707, \$24.95



Syquest Cartridges

Blank Cartridges #1360, \$89 each

Sony 3.5" DS DD Disks

Buy 50 at 69¢ each, or 100 at 59¢ each. Bulk with labels included. Lifetime guarantee! #915



EDUCORP

Computer Services

A Division of
Gazelle Technologies, Inc.
531 Stevens Ave. #B
Solana Beach, CA 92075
Orders: 1-800-843-9497
Info: 1-619-259-0255
FAX: 1-619-259-0367
Please include \$4 p/h for
UPS; \$7 p/h for Federal
Express. CA residents add
sales tax.

BUY ALL 10 DISKS FOR \$49.90

Some software on the EDUCORP individual disks and CD-ROM 4.0 are Shareware.

FREE!

352-page Software Encyclopedia™
describing over 10,000 programs.
Call NOW! 1-800-843-9497



We'll meet or beat any advertised price!

Credit card orders

call toll-free: 1-800-843-9497

Circle 60 on reader service card





The Macworld Catalog

Hardware

Bar Code	379	Medical	392
CD Rom	379	Multimedia	392
Computer Systems	379	Music/MIDI	393
Data Acquisition	382	Nutrition	393
Emulators	382	Programming Tools	393
Hard Drives	383	Public Domain	393
Memory Upgrade	384	Real Estate	393
Peripherals	386	Religion	394
Printers	386	Sales/Marketing	394
		Scientific	394
		Spreadsheets	395
		Statistics	395

Software

Astrology	386
Astronomy	386
Bar Code	387
Business	387
CAD/CAM	387
Children's	388
Clip Art	388
Data Base	388
Desktop Publishing	389
Duplicator	389
Educational	389
Engineering	390
Entertainment	390
Financial	391
Fonts	391
Genealogy	391
Graphics	391
HyperCard Stacks	391
Languages	392
Lottery	392

Services

Computer Insurance	395
Computer Repair	395
Data Conversion	395
Desktop Publishing	396
Disk Duplication	396
Laser Recharge	397
Training	397

Accessories

Furniture	397
Mouse Pads	397
Supplies	397

Miscellaneous

Business Opportunities	399
Mailing Lists	399

The Macworld Catalog Advertising Rates & Information

The Macworld Catalog section is a monthly link-up for advertisers and volume purchasers of Macintosh-related products and services. The Catalog offers advertisers a low-cost marketing opportunity and provides readers with a timely, easy-to-use menu for product buying.

Display ads are sold by column inches (2" minimum). Standard red is available as a second color. Text-only listings are available for a minimum of three issues at \$450 per issue.

For more information on *The Macworld Catalog*, call 800/888-8622.

The Macworld Catalog Advertising Sales Staff

Beverly Schneider, Telemarketing Sales Manager
Niki Stranz, Western Account Manager, 415/978-3105
Carol Felde, Eastern Account Manager, 415/978-3152

501 Second Street
San Francisco, California 94107
800/888-8622

Categories are subject to change

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Hardware

Bar Code

BAR CODE READERS



For All Macintosh Models

- No software changes
- Attaches as 2nd keyboard or through Mouse Port
- Installs in seconds
- Reads UPC/EAN, Int 2 of 5, Codabar, Code 128, MSI, and Code 39
- Outstanding read rate

Complete with Steel Wand—\$399
Magstripe Option—add \$100
64K Portable Reader—\$849

Bar Code Software

Code 39 fonts—\$99
UPC/EAN fonts—\$99

For Laser, Linotronic, Dot Matrix

1 YEAR WARRANTY
30 DAY \$\$ BACK GUARANTEE
800-345-4220

417 Ingalls Street
Santa Cruz, CA 95060
408-458-9938

WORTHINGTON
DATA SOLUTIONS

Postal Fonts For LESS

Save on postage with POSTNET/FIM
Our PostNet/FIM fonts:

- Work via the font menu
- Print on Image/Laser Writers
- Meet USPS requirements
- Saves you ¢ per Zip+4 envelope
- Cost: \$99.95, includes shipping
- Demo: \$20, applies to purchase
- Developer Inquiries Welcome!

Send check or money order
(MO. res. add 6.925% tax) to:

BarPost Symbolologies

P.O. Box 9914

O'Fallon, MO 63366-0314

314/625-3450

BAR CODE & MAGNETIC STRIPE READERS FOR MACINTOSH PLUS, SE & II

Connects on keyboard or ADB
Requires no additional program or port
Does not affect keyboard or mouse
Industrial quality, heavy-duty units
Also available

SmartCard encoder/reader
Magnetic encoder
Code 39 UPC & Printing Software
Portable Bar Code Reader

TPS Electronics
4047 Transport Street
Palo Alto, CA 94303
415-856-6833 800-526-5920
Telex: (Graphnet) 371 9097
FAX: 415-856-3843

CIRCLE 666 ON READER SERVICE CARD



Bar Code Readers

Simplify Data Entry, Retrieval & Collection

The power of automation, simple, accurate, & economical. As easy to install as plugging in your keyboard. No additional software to buy, works with any program that accepts keyboard input.

You can use existing bar codes or create your own. Scanning takes less time and training than manual entry. It is very Accurate. You select settings with a simple bar code menu. Setting are stored in non-volatile memory.

Models for all Macs. Keyboard wedge prices from \$399.00. Portable systems from \$619.00. Fonts from \$35.00

Call Now to Order or for Information
tel 800 347 3371 fax 209 473 0381

NEROS

P.O. Box 690787 STOCKTON, CA 95269-0787

CIRCLE 643 ON READER SERVICE CARD

Mail order

can save

you time—

and money!

CD Rom

MacCD Labs
PRESENTS

LARGEST SELECTION
LOWEST PRICES
KNOWLEDGABLE PERSONNEL

★ NEW RELEASE ★

DICTIONARY \$178
WEBSTER'S NINTH COLLEGIATE W/ SOUND!
A MUST FOR HOME, SCHOOL OR OFFICE

ENCYCLOPEDIA \$288
GROLIER'S NEW ELECTRONIC EDITION

MacGOODIES CD7 \$88
CDEVs, INTs, CLIPART!
DEMOS... INCREDIBLE!

Also EDUCATION • REFERENCE •
• CLIPART • PUBLIC DOMAIN •
• LEGAL • MEDICAL

NEC COR-35 PLAYER \$488
• Mac READY
• 650 MB
• PLAYS MUSIC

QUICKOR CD PLAYER \$788
• Mac READY
• FAST 350 MB
• PLAYS MUSIC

MacCD Labs
• OPTICAL STORAGE
• CD PLAYERS
• LATEST CD LISTINGS
• CDs PUBLISHED AND PRODUCED

800 447-4906

CIRCLE 639 ON READER SERVICE CARD

"I saw it in
Macworld!"

Computer Systems

Computer Center DATA

The Best / Prices / Quality / Services

MAC PLUS 1DR & KEYBOARD \$	1239.
MAC SE 1MB / SE30 1MB	1795./2795.
MAC SE 2/40 OR 4/105	2375./2695.
MAC SE/30 2/40 OR 5/80MB	3095./2575.
MAC IICX 2/40 OR 5/80	3695./4195.
MAC IICX 2/40 OR 5/80	4795./5290.
MAC IICX 4/80 OR 4/170	6999./7189.
MAC PORTABLE 1MB RAM, 40MB HD.	3985.
APPLE Color Monitor 13" & 83II Card	1148.
PPL PORTRAIT 100% APPLE COMP.	485.
RasterOps colorBoard 264 / 208	575./ 385.
RasterOps clearv. 2pg mofor&card	1145.
RasterOps 724 color system	5386.
Rackis PIVOT MONITOR & CARD	1288.
Rackis 2pg mono 17"21"color	885./2788.
IMAGWRITER II / LQ	435./945.
LASERWRITER INT / NIX	3175./4185.
HP DESKWRITER / LASER	845./CALL
MICROTECK 300Z SCANNER & INT.	1888.
MICROTECK 300GS	1469.
MICROSOFT WORD/EXEL/WORKS	239.
ALDUS Pagemaker / FREEHAND	369./324.
Com. PERIPHERALS 2400 BPS MODEM	149.

Desktop & International Orders welcome.

We also carry Cutting Edge, E Machines, NEC, IBM, Compaq Toshiba and many more in stock.

All items new. Plus Mfg. Warranty

2253 Westwood Blvd. L.A. CA 90064

(213) 470-9555

Fax (213) 470-9457

CIRCLE 589 ON READER SERVICE CARD

EXSEL DIRECT

1-800-624-2001

In NY: 716-272-8770

Refurbished Macs!

Mac 512K.....	\$ 545
Mac Plus.....	995
Mac Plus w/20MB Ext.....	1545
Mac SE Dual Floppy.....	1595
Mac SE/20.....	1995
Mac SE w/40 MB Int.....	2195
Mac II.....	CALL
Imagewriter LQ.....	749
Imagewriter II.....	375
Laser Writer.....	CALL
Laser Writer Plus.....	Call
800K External Drive.....	175

EXSEL INC.
THE ALTERNATIVE SOURCE FOR THE FUTURE

2200 Brighton-Henrietta Townline Rd.
Rochester, NY 14623

All units refurbished with 30-Day Warranty. VISA, MasterCard, prepayment, C.O.D. certified accepted.
Prices Subject to Change.

CIRCLE 685 ON READER SERVICE CARD

Continued...

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog



\$189
per mo

RENTALS

Also Available:

- Macintosh • IBM PS/2
- Compaq • Laser Printers
- Laptops • Portables

And a host of other peripherals

Call Toll-Free

800-765-4727

Next Day Delivery
Anywhere in the U.S.A.

PC Computer Rental

CIRCLE 551 ON READER SERVICE CARD

In U.S.A. Call:
1-800-729-7031
New Jersey

Mac Sale

In Canada Call:
1-800-268-7805
Toronto, Ontario

Brand new, latest models in stock!
One Year Warranty Included

Entire Mac Line

New and Used: Bought and Sold

The Best Prices, Quality and Service. Period.

CIRCLE 604 ON READER SERVICE CARD



Parts/Systems

Shreve Systems
2421 Malcolm St.
Shreveport, La. 71108

We BUY Systems!
Trades & Upgrades-CALL!

1-800-227-3971

La. call 318-635-1121
FAX 318-865-2006

CIRCLE 644 ON READER SERVICE CARD

INTERNATIONAL COMPUTER CENTER

MAC II FX 4MB 80 MB	\$6969
MAC II FX 4MB	\$6369
MAC Portable 40MB	\$3795
MAC IICI 1MG	\$4195
MAC IICI 4MG 80MB	\$5285
MAC IICX 1MG	\$3195
MAC IICX 4MG 80MB	\$4095
MAC IIX All Models	CALL
MAC SE/30 1MG 40MB	\$3075
MAC SE/30 4MG 80MB	\$3569
Laser NT/NTX	\$3075/4075
8 Bit Video Card	\$409
13" RGB Color Monitor	\$699
Full Page Monitor & Card	\$1149
Image Writer II	\$425
H.P. Deskwriter	\$819
H.P. Scanjet & Int.	\$1444
Radius 2 Pg. Mono/Card	\$1295
Reg. Keybd./Extended	\$95/170
All Items New/VISA & MC Add 2%	

(800) 767-7706

FAX (818) 891-3285

16175 Roscoe Blvd.
Sepulveda, CA 91343
U.S.A.

CIRCLE 684 ON READER SERVICE CARD

1-800-334-KIWI

Mac Plus	\$1250
Mac SE 40mb	\$2150
Mac SE 40/2.5mb	\$2295
Mac Portable 40mb	\$3995
Mac SE/30 40/2mb	\$3150
Mac SE/30 100/5mb	\$3795
Mac IICX 40/2mb	\$3695
Mac IICX 100/5mb	\$4295
Mac IICI 100/5mb	\$5295
Mac IIFX 100/4mb	\$6995
Apple color monitor	\$695
Apple 8 bit video card	\$375
Apple keyboard	\$100
Apple ext keyboard	\$175
Imagewriter II	\$435
Imagewriter LQ	\$975
Laserwriter NT	\$3150
Laserwriter NTX	\$4295
H.P. Deskwriter	\$845

All items new. 1 year warranty.
Most items in stock today.
Visa & Mastercard add 2%
C.O.D. orders accepted.

KIWI COMPUTERS

P.O. Box 67381
Los Angeles CA 90067
US & Canada (800)334-5494
International (213)553-4507
Fax (213)286-9667
Mon-Fri 8:30am-4:30pm PST

CIRCLE 608 ON READER SERVICE CARD



**Your #1
Discount Source
For Macintosh**
Cyster Bay N.Y. 11771

We are the alternative to 'Box-Pushing' Discounters
... small, Mac-knowledgeable & service oriented!

MacSE/dual floppy	\$1789	•	MacSE20/HD20	\$2049
MacSE/30HD40	\$2999	•	MacSE/30 5mb/HD80	\$3599
MacIICX/HD40	\$3599	•	MacIICX 5mb/HD80	\$4099

MacIICX 2mb/HD40 \$4599 • MacIICX 5mb/HD80 \$5099
MacPortable/40 \$3699 • LaserWriter II NT \$3099
MacII fx4mb/HD80 \$6499 • MacII fx8mb/170Q \$7499
RasterOps 19" Clearview II-SE30 GreyScale \$1579
NewGen Turbo 400 dpi FAST Laser Printer \$3899
Abaton 300GS Scanner \$1299 INTERFAX 24/96 \$379

"N.Y. Style Discounts... We Beat the Competition!"
International Orders Our Specialty... Fax Us!
For Quotes (516)922-2805 • FAX (516)922-2803
Toll-Free Order Line **(800)234-MAC1** Monday-Friday 10am-6pm EST

CIRCLE 617 ON READER SERVICE CARD

The Macintosh® for Industry

For those off the desktop applications, there's RackMac™.

An industrial grade Macintosh IIX, also available with matching industrial touch display and rack-mounted keyboard/mouse drawer.

For vehicular, medical, laboratory, automated test, process control, operator entry application.



GreenSpring Computers

1204 O'Brien Drive Menlo Park, CA
94025 Tel 415-327-1200

CIRCLE 671 ON READER SERVICE CARD

Extraterrestrial Prices

Beat all prices, lots of freebies! Call for \$ lowest prices. COD.

MacPlus	\$1045
SE2	\$1749
SE2/32mb, SE/30-4/80mb	\$low
IICX	\$3149
IICX 40mb	\$3675
IICX 4/105mb	\$4249
Laserwriter IINT	\$3099
IINTx w/cable/toner	\$4199
IICI, -fx Portable	\$low

*Jupiter Computers,
624 Knox Ave.
Fontana, CA 92336,
714/829-2953 Fax: 356-1178*

UPGRADE YOUR \$12 PLUS & SE TO A LAPTOP



PROMAS LAPTOP KIT

**For detail
PROMAS OA SUPPLIES LTD.**
Block A, 8/F., Kee Shing Centre,
74-76 Kimberley Road, Kowloon,
Hong Kong FAX: (852)7211828

CIRCLE 595 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Apple • Radius • SuperMac • RasterOps • Abaton • Quantum • Rodime • Hewlett-Packard • Microtek • And More!

Everybody Sells Macs. Only Mac•In•Stock™ Adds Six Warm Fuzzies.

1. Expertise

Call us. Right away you'll discover you're not talking to a phone person. You're talking to a Mac person.

2. Attitude

We employ the sophisticated new "a-b-c" sales technique.

(a) We listen. (b) We answer your questions (or research better answers) until (c) you're sure you've configured the right system for your needs and your budget.

3. Simplicity

We offer great prices and toll-free technical support. That is all. We ship Macs anywhere in the Free World. Shop around. Then call us. We'll make your day.



4. Straight Answers

We love to sell, but don't be surprised if we suggest something that we don't sell. If you need a single source, we'll supply everything on your list.

But if you need the very best price on every single item, we just might tell you where to buy something at a better price than ours.

5. No Asterisks

Don't you love it when a flashy low price refers you to a footnote that says: "price with system"?

We don't do asterisks. It's tough enough to balance your needs against dollars without somebody playing games with your money.

6. Customer Satisfaction

Before you buy, get local references. Our customers will tell you what warm fuzzies are, and why you need them.

Call Us Last!

Your 'Mac' Specialists
Mac•In•Stock™

800-633-1538

Fax Your Request For A Quotation: 213-322-1486. International Inquiries Welcome: 213-322-1455. © 1990 2M Group, Inc.

CIRCLE 692 ON READER SERVICE CARD

AMERICA'S LOWEST PRICED MACINTOSH SYSTEMS



Let our specialists help you design a MONEY SAVING PACKAGE to meet your needs
COMPARE OUR ADVANTAGES

- KNOWLEDGEABLE SPECIALISTS
- FAST SHIPPING
- LATEST PACKAGES
- PRETESTED PACKAGES
- EXTENDED WARRANTY WITH OVERNIGHT REPLACEMENT
- VALUE & SAVINGS
- EASY - HASSLE FREE WAY TO BUY YOUR SYSTEM!



CALL NOW TOLL FREE
800-622-8804

Build Your Own Mac Book

Assemble your CAT Mac from readily available catalog parts & save \$\$\$\$. Start with an Apple Macintosh® 128K thru SE30, Mac II or IIfx logic board - add case, keyboard, mouse, monitor, and disk drives of your choice. Hints, tips & secrets in new 2nd edition make it easier than ever. Illustrations & photos show how \$24.95 postpd. Visa/MC, Check U.S. & Canada.

Brant Associates - Dept. W
4420 SW Mark Kelly Court
P.O. Box 68708
Portland OR 97268

We Buy Mac's too!

Macintosh Plus	\$899
Macintosh SE.....	\$1499
Macintosh SE 20.....	\$1699
Macintosh SE/30 (80/4).....	\$3599
Macintosh II (40/1).....	\$2499
Macintosh IIfx (80/4).....	\$3999
Macintosh IIfx (80/4).....	\$5299
Macintosh IIfx (80/4).....	\$6799
LaserWriter IINTX.....	\$3799



Elite Computers & Software, Inc.

10601 South De Anza Blvd • Suite 305 • Cupertino • CA • 95014
(408) 725-1556 • (408) 973-1483 Fax

Quantities are limited!

Prices are subject to change without notice. These prices reflect a cash discount.

CIRCLE 566 ON READER SERVICE CARD

Continued...

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

CIRCLE 590 ON READER SERVICE CARD



The Macworld Catalog

Maya Computer Total Service

Maya's expert service technicians can save you hundreds of dollars by doing fully warranted repairs of only what's broken, all the way down to board level. We don't just swap out entire modules to fix an inexpensive component.

**WE SELL MACS
WE BUY MACS
WE FIX MACS**

The Maya Guarantee

Satisfaction is guaranteed. Maya Computer offers a one year parts & labor warranty on both new and used Macintosh computers. Return any product in saleable condition within 30 days of purchase for a cheerful refund or credit.



We Buy & Sell Macs

...one system or complete offices. Give Maya a call before you buy. At Maya Computer we use the technology we sell. Strictly Macintosh, Simply The Best!

CPUs	
Macintosh Plus (used) 1 Yr. Warranty	\$879
Macintosh SE (demo) 2 mb 40 mb 1 Yr. Warranty	\$1349
Macintosh II (new) 5mb RAM 105mb Quantum	\$3590
Macintosh IIfx (new) 8mb RAM 320 mb 10ms Wren	\$8599
Upgrades & Accelerators	
Mac II to IIx - 80386 drive & ROMS	\$299
Mac SE or Mac II SuperHappy Upgrade	\$572
NeXTStep - NextLife 1	\$199
DayStar Digital 50MHz PowerCard	\$2245
Displays & Video Interfaces	
Raster Ops ClearVue 19" Display w/ card (SE or II)	\$1099
Raster Ops ClearVue GS	\$1649
Seko Trinitron 14" w/ Raster Ops 254	\$1265
Microtron Xcel for Mac II, 13 & 14"	\$299
Raster Ops 304 Card	\$1496
Computer Eyes Professional	\$335
Printers	
Sharp XJ730 Color Inkjet w/ Cut Sheet Feeder	\$1795
HP DeskWriter	\$799
Toshiba P221 SL w/ Mac Matrix	\$529
Texas Instruments PS35	\$2295
Texas Instruments PS17	\$1875
Ricoh 6000PS Laser	\$2295
Kodak M150 w/ ATM	\$515
QMS PS 810 Turbo	\$4495
QMS PS 810 Dual Bin	\$4495
QMS ColorScript 100 Model 10	\$7495
NEC ColorMate PS	\$7495



**Diskettes
PREFORMATTE**
50 Double Sided \$33
25 High Density \$49
Sony Bulk DS \$0.64
Sony Bulk HD \$1.69 each

Upgrade SPECIAL! for Plus SE SE/30, II Ix
Dove Marathon '030 TAKE ADVANTAGE
OF SYSTEM 7
bundled with SUM II & SAM 2.0 **\$444**

Hard Drives & Media	
330 mb 10ms Imprimis Wren Internal	\$1799
330 mb 10ms Imprimis Wren External	\$1949
SyQuest 45 mb Cartridge	\$79
Prime/Seagate 512 or 1024 Optical Media	\$208

Modems	
Adaxion Interfax 2456	\$375
Sage 2400baud w/ Microphone 1.5	\$183

Scanners w/ Interfaces	
Adaxion 300GS Flat Bed	\$1295
Microtek MSF-300Z Color Scanner	\$1998
Sharp JX 100 Color Hand Held Scanner	\$745
Sharp JX 300 Color Scanner	\$2245
Logitech - ScanMan model 32 400DPI	\$394

Music	
Mark of the Unicorn - Performer 3.0	\$399
Mark of the Unicorn - MIDI Time Piece	\$399
Ans Nova - Practica Musica	\$73

Accessories	
NoRad Screen for MacPlus & SE	\$94
NoRad Screen for 13" & 14" RGB monitors	\$104
NoRad Screen for Full Page monitors	\$104
NoRad Screen for 19" TPO monitors	\$319
Kensington SE anti glare RAD Filter	\$52
Kensington Tucked Mouse ACB	\$109
Kensington Masterpiece Remote	\$109
52 piece Mac Tachy Toolkit	\$49

Software	
Claris - MacWrite II w/ ATM & Typewrite 1 & 2	\$249
Adobe - TypeAlign & TypeManager	\$95
TeleTypeScripting - T-Script	\$99
Adaxion PageMaker 4.0	\$499
Claris CAD	\$539
QuarkXpress	\$499
QuarkStyle	\$167

Data Acquisition

Data Acquisition & Analysis
Complete hardware & software solutions for the scientist & engineer. Acquisition hardware & software, Analysis software, Signal conditioning modules, & Language interfaces. A friendly, knowledgeable technical staff can guide you from start to finish with proven solutions in Industrial, Scientific, Engineering & Laboratory environments. Call or write for a catalog & price list.

BIOPAC Systems,
5960 Mandarin Dr. #D5
Goleta, CA 93117
805/967-6615

Emulators

II in a Mac

An Apple IIe computer
...all in software!

Run Apple II software on your Macintosh.
Convert Apple II files to Macintosh files.

\$149.95 Add \$3 for P&H

COMPUTER:applications, Inc.
12813 Lindley Drive Raleigh, NC 27614
(919) 846-1411

CIRCLE 583 ON READER SERVICE CARD

PURCHASING POWER



*The Macworld
Catalog
caters to power:*

More Macworld subscribers* are directly involved in their company's purchase of hardware and software than any other Macintosh magazine.

*The Macworld
Catalog links you
instantly with
375,000
powerful buyers.*

To find out how to reach them—
for less—call now.

800.888.8622

*Macworld's 1990 Subscriber Study

See us at
MacWorld
Booth #262

Maya
computer

Waitsfield, Vermont

802-495-6882
FAX 802-498-8110
800-541-2318

CIRCLE 605 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



Hard Drives

For a limited time
REDUX \$20
w/ drive purchase

40 mb \$339*

Quantum

*Internal

Quantum 12ms Access

Capacity	Internal	External
40 mb	\$ 339	\$ 439
80	519	619
105	599	699
120	699	799
170	899	999

Imprimus WREN Drives

173 mb	1159	1259
300 Half Height	2095	2195
300	1499	1649
330	1999	2149
404 Half Height	2295	2395
600	2095	2295
630	2595	2749
1 Gig	4349	4595

Maxtor 200 999 1099

- Quantum & Maxtor Internal Drives fit Mac II/IIX/SE/SE30/Cx/Ci/Fx
- Imprimus Internal Drives fit Mac II/IIX/IIFx

Syquest 45 meg Removable \$649

- All Include one cartridge • \$76 per cartridge for additional cartridges

Teac 60mb Tape With Retrospect! 599

Teac 155mb Tape With Retrospect! 699

WangDAT 2395

- All Include one cassette

Dual Drive Combo's

1 gig WREN/WangDAT 6995

600 mb/WangDAT 4495

600/Teac 155 2895

600/Syquest 2895

300/Teac 155 2295

300/Syquest \$2295

ASK ABOUT OUR OTHER COMBO's

- All Tape Combo's Include one cassette and Retrospect!
- All SyQuest Combo's Include one Cartridge

All Drive products carry a 30 day Money-back guarantee. Quantum, Maxtor and Syquest Drives carry a two year "parts & labor" disk-for-disk replacement warranty. WREN, Teac, WangDAT and Syquest Cartridges carry a one year "parts & labor" disk-for-disk replacement warranty. All Hard Drives include all brackets, cables and cords and LED's required for operation. All Hard Drives come pre-formatted with Apple's latest stable System software, 12.5 MB of Publicly Distributable software from the BMUG Library, and the "ALLIANCE POWER TOOLS" SCSI formatter/Partitioner.

APS Alliance Peripheral Systems

2900 S. 291 Hwy • Lower H • Independence, MO
64055 • (816) 478-8300

1-800-233-7550

9:30am - 7:00pm
Central Time

fax: (816) 478-4596
24hrs.

Toll Free U.S. and Canada
VISA/MC, Corp., Gov., Univ. PO's, NO SURCHARGE
AMEX ACCEPTED
International Orders Call (816) 478-8300

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

Memory Upgrade

BEST PRICES IN MEMORY!

- 1 Meg Module
- 4 Meg Module
- IIfx Module
- NTX Module
- Laptop Module
- Lifetime Warranty
- 30-Day Money Back Guarantee
- Credit Cards & Personal Checks
- Overnight Delivery Available

FREE Installation Kits

(800) 688-7466
PO FAX# (512)794-8520

TechnologyWORKS

4030 Braker Lane West
 Suite 350
 Austin, Texas 78759
 (512)794 8533

CIRCLE 690 ON READER SERVICE CARD

Mac Rescue™ to the Rescue

6 megs of RAM for Classic Macs. Burial at sea for the Classic Macs? Never! There's years of productive life in all enhanced 128K and 512K Macs. Mac Rescue gives them the functionality of a Mac Plus, up to 4 megs of RAM plus a 2 meg RAM Disk and a SCSI Port. The obedient daughterboard snaps on the motherboard in minutes. One year warranty. RAM Disk software available.

A RAM Disk instead of a hard disk. In many situations, the RAM Disk eliminates the need for a hard disk, you just load the application(s) into RAM and use the floppy drive for data transfer.

We design, make and market 256K, 1 meg and 4 meg SIMMS, Softstep® memory expansion modules and

reports of my
demise are
barefaced lies!



Mac Rescue™ an upgrade board for Classic Macs. All have a one year warranty. Call today.

Ford Centre, Suite 1180
 420 North Fifth St.
 Minneapolis, MN 55401
 (612) 371-0061
 (800) 950-CARE (2273)
 (612) 371-9342 Fax



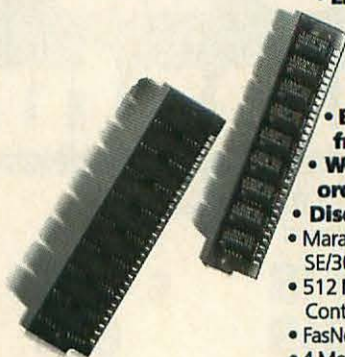
Computer Care

Dealer Inquiries Welcome. Visa/MC Accepted.

CIRCLE 584 ON READER SERVICE CARD

YOU'RE JUST A PHONE CALL AWAY FROM ALL YOUR MAC EXPANSION NEEDS

1 meg x 8 SIMMs
\$60



NECS
NEW ENGLAND
CIRCUIT SALES, INC.

292 Cabot Street, Beverly, MA 01915 Telefax: 508-922-1341

CIRCLE 562 ON READER SERVICE CARD

- Call us anytime, 8:00 AM — 5:00 PM EST
- **Lifetime overnight replacement warranty.** We'll replace any NECS memory upgrade for any reason within 24 hours of your phone call.
- **Every order shipped directly from stock—no backorders.**
- **We accept verbal purchase orders.**
- **Discount for Universities.**
- Marathon 030 for MAC Plus, SE, SE/30 and IIX
- 512 Memory Upgrades • Ethernet Controllers and Adapters
- FasNet 020 Multifunction Board
- 4 Meg Module
- II FX Module • NTX Module
- Laptop Modules

Call and ask for our Memory Division at 1-800-233-1312

Macintosh

PageMaker Adobe 88
 HyperCard Quark
 Foxbase Works
 FileMaker Systems
 Freehand Excel
 Ready Set Go Word

MacProfessional
Learning Systems

904-761-7576

Best Memory Upgrade Money Can Buy "It's easy with the use of your VCR."
Free Video Taped Training Catalog on popular business applications.

CIRCLE 619 ON READER SERVICE CARD

DOS/IBM

Learn Dos Excel
 WordStar dBase
 Ventura Works
 Multimate Lotus 123
 WordPerfect Word
 PFS First Choice & more

THE SIMMER

Adds SIMM sockets and SCSI port to your 128/512 Macintosh

\$199 (0 Meg)

1M \$239, 2M \$329, 2.5M \$339, 4M \$459

Dealers Wanted!

1 Meg SIMMS \$59 w/Trade
 Low Profile Life Guar. Immed. Del.

128 to 512 \$99 Wanted: 128K Macs, 256K simms

Digi-Graphics

764 E Village Way
 Kaysville, UT 84037
 (801) 544-2009



CIRCLE 610 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



**When you get serious about your Macintosh,
give PSI a call.**

No more kidding around. PSI manufactures all the upgrades you need for your oldest Mac Plus to your newest Mac Portable. We make 1 meg SIMMs, 4meg SIMMs, LaserWriter IINTX SIMMs, Portable Memory upgrades, an internal FAX/Modem for the Portable, a Cache Card for the IICI, and a removable SCSI Hard Drive for all your Macs. We can satisfy your every Mac need under one roof!

800-622-1722 • 408-559-8544 in CA

PSI 2005 Hamilton Avenue, Suite 220 San Jose, CA 95125

CIRCLE 634 ON READER SERVICE CARD

MEMORY UPGRADES
256K/1MB/4MB SIMMS
NTX/FX SIMMS
PORTABLE MEMORY
 LIFE TIME WARRANTY
 30 DAY TRIAL
 LOW PRICES
 VISA/MASTER CARD
 PURCHASE ORDERS ACCEPTED FROM
 GOVT UNIV. AND CORPORATE CUSTOMERS

ADD ON AMERICA
 DIVISION OF ROHM CORP.
 15 WHATNEY, IRVINE, CA 92718
 (714) 859-3018 / FAX (714) 859-2110

1 - 800 - 292 - 7771

CIRCLE 553 ON READER SERVICE CARD

MEMORY DIRECT
 "Don't pay retail...buy direct"
 Memory Upgrades for your Macintosh

NEW MAC IIFX		MAC SE/30		MAC IIX, IICX, IICI	
4 MEG KIT	495.	1 MEG KIT	89.	1 MEG KIT	89.
16 MEG KIT	2399.	2 MEG KIT	130.	4 MEG KIT	256.
32 MEG KIT	4749.	4 MEG KIT	256.	8 MEG KIT	504.
		8 MEG KIT	504.	16 MEG KIT	1725.
				32 MEG KIT	3439.

NEW MAC PORTABLE		MAC PLUS OR SE		LASERWRITER II NTX	
1 MEG KIT	590.	2 MEG KIT	130.	1 MEG KIT	195.
3 MEG KIT	CALL.	4 MEG KIT	256.	4 MEG KIT	425.

Upgrading your Apple is easy and inexpensive!

P.O.s accepted for:
 • Fortune 1000
 • Government
 • Educational Institutions

Call now to order
 1-(800) 486-CHIP (2447)
 FAX Orders: (714) 847-5043
 Technical Support: (714) 848-5958

Memory Direct • 7911 Professional Circle • Huntington Beach, CA 92648
 Your memory source for Apple, IBM, Compaq, Hewlett Packard, AST, Epson and More!

VIDEO RAM
 MAJOR MANUFACTURERS

CIRCLE 691 ON READER SERVICE CARD

UPGRADES!
 512Ke - Plus \$295
 512K - Plus \$625
 128K - Plus \$695

MEMORY
WE ARE LOWEST!!!
Peripheral Outlet
 314 S. Bdwy • Ada, OK 74820
(800) 332-6581
 405-332-6581 Fax 405-436-2245
 Visa & MC okay (add 3%)

CIRCLE 687 ON READER SERVICE CARD

SOUTH COAST ELECTRONICS

- Made in USA
- Lifetime Warranty
- Same Day Shipment
- Government, University & Fortune 500 POs
- MC, VISA, AMEX

(800) 289-8801
 10920 Wilshire Blvd. Suite 1100, Los Angeles, CA 90024
 (213) 208-3260 (213) 208-3282 FAX

CIRCLE 654 ON READER SERVICE CARD

Continued...

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

One of the Nation's Fastest Macintosh™ Upgrade/Repair Facilities is Growing!

SIMMONS CONSULTING IS NOW SIMMONS MICROSYSTEMS

**Same Day Turn-Around - Nationwide
30 Minute Turn-Around - Locally**

- New and Used Macintosh Systems Available
- 120 Day Warranty on New Equipment - 90 Days on Used!
- Requests for Quotes Via FAX
- Nationwide Leasing Capabilities for Businesses
- Dealer Inquires Welcome



(215) 352-6883 Ext. 30

FAX # (215) 352-6975

6417 Market St.
Upper Darby, PA 19082

CIRCLE 616 ON READER SERVICE CARD

Peripherals

MEMORY/HARD DRIVES FITS ALL MACS

		INTERNAL	EXTERNAL
SEAGATE	20MB	\$259	\$399
SEAGATE	30MB	289	369
QUANTUM	40MB	333	430
QUANTUM	80MB	515	609
QUANTUM	105MB	595	695
QUANTUM	170MB	839	935

QUANTUM 2 yrs. SEAGATE 1 yr Warranty

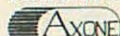


- 1 meg x 8 80ns for MAC/SE, cx... \$66
- 1 meg x 8 80ns for MAC fx \$89
- 1 meg x 8 80 for Lesar Writer \$89

Life Time Warranty



QUANTUM 170MB INTERNAL \$839



Tel: (215) 341-8608
Fax: (215) 971-0559

AXONE Computer Systems, Inc.
60 Chestnut Ave., Suite 207
Devon, PA. 19333



ORDER CALL: 1-800-955-0388

University & Corporate Welcome
Ship in 24 hours/Match any HD/Lower price

CIRCLE 591 ON READER SERVICE CARD

LIQUIDATING

PostScript Laser Printer

Canon 8ppm, 300x300dpi,
2 meg RAM expandable to 3
35 Adobe Postscript fonts,

\$2495

MC/VISA Accepted

CRA SYSTEMS INC.
800-950-8212

CIRCLE 574 ON READER SERVICE CARD

REMOVABLE HARD DISK SYSTEMS

REWRITEABLE OPTICAL

1.3 GB \$7925

650 MB \$4050

WINCHESTER

100MB \$2605

50 MB \$1360

24 MONTH WARRANTY

See your local dealer or call:

DMA Technologies, Inc.
601 Pine Ave., Goleta, CA 93117
Call 805-964-0733 or 800-223-9443
Fax Inquiries: 805-964-0734
Visa/Mastercard


CIRCLE 580 ON READER SERVICE CARD

Printers

TRUE Letter Quality on Mac
Apple Daisywheel produces sharp text
on all Macs (far superior to "LQ" of
any matrix). Fast 40 char/sec on 1 page
or 10-part forms. Fixed & proportion
(with legal, foreign & math symbols).
Auto boldface, underline, subscripts, 15%
wide paper. NEW \$449, RECOND.
\$349 incl. printwheel, ribbon, cable &
easy point-&-click printer resource.
New sheetfeeder \$49, tractor \$149.
High commercial quality w/90-day gte.
Quality Discount Computers, Inc.
135 Artist View Drive
Wellington, NV 89444
702/465-2473, 415/487-8148

Software

Astrology



MCHOROSCOPE

**Be your own astrologer,
for fun or profit.**

Produce amazing astrological reports
for friends and family. **\$199.50**

"McHoroScope" (Chart Interpreter) produces beautiful natal charts
plus 15- to 17-page interpretations. Professional astrologers
charge \$50.00 and more for similar reports. Excellent study guide
for students and great fun for parties and get-togethers.

Astrology for the Macintosh from Time Cycles Research

• Write or call for free brochure •

Time Cycles Research 27 Dimmock Rd Waterford, CT 06385
(203) 444-6641 MC-VISA-Amex

CIRCLE 675 ON READER SERVICE CARD

Astronomy



Voyager

Pluto and the Outer Planets

The Interactive Desktop Planetarium

- "Fantastic software!"
- "Best software value ever"
- "I haven't slept in 2 weeks!"

Exaggerations? Perhaps, but our users tell
us that Voyager may be the Ultimate Sky
Simulator and Computer Star Atlas....
for the MAC II, SE or PLUS

Version 1.2 - \$124.50 + \$4.50 s & h
Carina Software, 830 Williams St
San Leandro, Ca 94577
(415) 352-7328

CIRCLE 696 ON READER SERVICE CARD

Reach your audience
when it counts.

Catalog readers are
ready to buy!

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Bar Code

ANNOUNCING ...

POSTAL Bar Code Fonts



- Lower Postage Costs
- Faster Mail Service
- Fewer Delivery Errors

with FIM Codes

High Quality PostScript®
Fonts for LaserWriters &
High Resolution Typesetters

Save money by creating artwork using
PrintBar bar code fonts with Desktop

Publishing and Illustrating programs. Easily generate labels in
database managers or word processors.

Vol. 1	Code 39	ImageWriter, LaserWriter
Vol. 2	UPC-A, UPC-E, EAN-8, EAN-13	LaserWriter, Linotronic
Vol. 3	Interleaved 2 of 5	ImageWriter, LaserWriter
Vol. 4	Code 39	Linotronic
Vol. 5	PostNET, FIM	LaserWriter, Linotronic



CALL FOR FREE BOOKLET
"21 Ways to Use Bar Codes"

BearRock

6069 Enterprise Drive • Diamond Springs, CA 95619
Phone 916-622-4640 • Fax 916-622-4775

CIRCLE 567 ON READER SERVICE CARD

Business

BizPowerTools

BizPlanBuilder™ New v.4.0. Intuitive & logical
business & marketing plan template on diskette for
raising capital, launching new products or services.
90+ pages of outlines, headlines, written texts &
ideas... formatted into 33 MacWrite/MSWord files.
Sales & marketing oriented—follow tutorials, fill in
the blanks, edit into a finished plan. Linked financials
in Excel (SYLK). Proven successful. \$99

• We applied for a loan in early November
and by Christmas we had \$4,200,000.~

• It's excellent—just the thing we need.
It's saving us about 90% of the work.~

• My CPA highly recommends it.~

• Companion software packages:

• Employee Policies Handbook	\$99
• Business Agreements Collection	\$99
• Equip/Real Estate Investment Analysis	\$139
• Mfg Planning spreadsheet MRP	\$149
• Private Stock Offering raise up to \$1Mil	\$149
• Limited Partnership Agreement	\$149
• DealMaker™ Business Valuation	\$395
• Leverage your time & Macintosh	MC
800/ 442-7373 toll-free	Visa
415/ 941-9272 outside U.S.	Amex

CIRCLE 663 ON READER SERVICE CARD

FINANCE

FREE Sample Reports & Brochures

Mainframe Power for your Macintosh

Designed by a CPA and attorney. What-if analysis or
print unique customizable reports. Better and more
versatile than spreadsheets and calculators.

Excellent customer support. Customization available.

Present Value Calculates PV, FV, NPV, IRR,
Annuities, Variable rates and payments; and more!

Loan Amortization Any loan terms imaginable!
Biweekly, APRs, Points & Fees and more.

Loan Comparison Compare and analyze 5 types of
loans at once. Choose from several comparison
reports. For new loans or refinancing analysis.

Accounting Keep track of loan or rental payments
for entire portfolios or single accounts. Record
payments as they are made. Many optional reports.

30 day money-back guarantee!

These programs have been making Attorneys,
Accountants, Bankers, Real Estate and Financial Pro-
fessionals more profitable over the past 7 years! Over
11,300 Users! Fast and reliable calculations.

Softlair • 8753 Parkview • Milwaukee,
WI 53226 1-800-453-8338
Add \$5 S/H MC/VISA/AMEX

CIRCLE 649 ON READER SERVICE CARD

POSTAL BAR CODING SPEEDS DELIVERY, SAVES POSTAGE

MacEnvelope™

Envelope/Label Printing

Company Name Street Address City, State, ZIP	Company Name Street Address City, State, ZIP
Company Name Street Address City, State, ZIP	Company Name Street Address City, State, ZIP
Company Name Street Address City, State, ZIP	Company Name Street Address City, State, ZIP
Company Name Street Address City, State, ZIP	Company Name Street Address City, State, ZIP
Company Name Street Address City, State, ZIP	Company Name Street Address City, State, ZIP
Company Name Street Address City, State, ZIP	Company Name Street Address City, State, ZIP

SYNEX
480 Tenth Street
Brooklyn, NY 11215

Peterson Packaging
Attn: Andrew
541 Route 19
Highway, PA 37124-8000

Info Acquired

One package does it all!
Labels, bar coding,
envelope printing.

MacUser
10/89

(800) 447-9639
FAX (718) 768-3997

Check/Visa/MC/AE \$89.95 + \$4 s/h (NY + tax)
SYNEX 692 10th St., B'klyn NY 11215-4502

SYNEX

CIRCLE 659 ON READER SERVICE CARD

Emulate!™ • WYSE™ • TeleVideo™ • Hazeltine™



Emulate!

Now you can emulate Wyse 50 or 60™, TeleVideo™, &
Hazeltine™ terminals on your Mac! Direct connect / data
capture from your mini or mainframe computer. F Keys,
Macros, Slave Printing, 132 Column. Reverse Screen
Plus Many More Advanced Features!

\$175

Call. Add
Sales Tax

FREE EVALUATION COPY
Available
For Business Users

Plus \$3.75 2nd Day Air Shipping
1-800-327-1829

Dealer Inquiries Invited/Multi-Copies Available

TLC 9800 D Topanga Cyn Bl. Ste 280.
Chatsworth, CA 91311 818-998-8889

FAX 818-765-2539

All trademark rights acknowledged
Emulate!™ © 1990
Cornerstone Data Systems

CIRCLE 680 ON READER SERVICE CARD

STILL TYPING to ADDRESS an ENVELOPE?

- Prints labels one at a time, in seconds • Simple to use
- DA format allows you to paste from any application
- All standard laser label sizes • Multiple fonts and sizes • \$79.95

Quick Label from Octo Logic, 2730 Wilshire Blvd. Suite 621
Santa Monica, CA 90403 (213) 828-3527 Fax: (213) 828-5605

CIRCLE 558 ON READER SERVICE CARD

Macworld Magazine.

When you get
down to
business, you
can't do
without it.

CAD/CAM

Professional CAD Symbol Library

Over 2,700 CAD Symbols in One All-Inclusive Package



Architectural (Residential & Commercial), Interior
Design & Site Planning, The "Plumbing &
Heating Supply House", The "Hardware Store",
The "Electronics Shack", Welding, General
Drawing Aids, Cartographic, 180+ Page User's
Manual, And Much More, All for \$119.95!

Advanced System Design, Inc.
1010 Stagecoach Blvd., P.O. Box 3131
Evergreen, Colorado 80439
(303) 674-2222 to Order (Specify CansCAD or MacDraw II version)

CIRCLE 615 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.



The Macworld Catalog

Children's

NEW RECIPE FOR 3 TO 9 YEAR OLDS:

ALPHABET SOUP

Amazing graphics and digitized sounds!

An educational Macintosh Hypercard program for children.

* It is designed to help your 3 to 4 year old pronounce the alphabet letters.

* It teaches 5 year olds and older the equivalent letters to sign language, flag language, and Morse Code.

* Spelling Bee is a superb game feature which includes 11,000 words, each popping up randomly.

Spelling BEE Spelling BEE

* For 3 to 5 year olds: it features words with less than 5 letters.

Match the word, letter-for-letter to win!

* For better spellers, use the advanced level - 6 or more letters per word. The child can also hide the word until it is spelled correctly.

A new program from: AUTO TEACH, a subsidiary of Integrated Data Solutions

Only \$24.95

Age Group - 3 to 9 years

To order call toll free 1-800-366-4416, 9am-6pm Mon-Fri, 10-6 Sat.

Or send your check to: 5356 Clayton Road, Suite 224 Concord, CA, 94521

CIRCLE 631 ON READER SERVICE CARD

Clip Art

Samples from Dimensions 2 Retail: \$99.95

ENCAPSULATED POSTSCRIPT FULL PAGE IMAGES

Dimensions Vol. 2 — \$99.95

Use as backgrounds and settings to give a professional look to any page layout.

For Orders/Information Call (714) 881-1200 or:

1-800-444-9392

Artbeats, Box 20083, San Bruno, CA 9406

ARTBEATS

CIRCLE 570 ON READER SERVICE CARD

THE SANTA FE COLLECTION

NATIVE AMERICAN & SOUTHWEST Images. Ancient to Modern Designs. Paint format. 500 ILLUSTRATIONS and 130 BORDERS on 3 DISKS! Includes Artisto+ DA. Prompt Delivery. Check, PO.

*10% discount on orders before 9/30/90!

Ordering & Information:

1-800-245-7824

RT COMPUTER GRAPHICS \$79.95

2257 Calle Cacique, Santa Fe, NM 87505

CIRCLE 695 ON READER SERVICE CARD

Maps!

World, Continents, USA, & states by county! Object-oriented and bit-mapped available. Ideal for publications and presentations. For FREE brochure please call or write:

800-334-4291

MicroMaps Software, Inc., Box 757, Lamberville, NJ 08530

CIRCLE 625 ON READER SERVICE CARD

New Original Mac™ Art

350+ high quality DPS & Macpainttm images on 5 disks. For novice or pro.

Free gift with any purchase.

• Vol. 1-Symbols (\$24.95)

• Vol. 2-Designs (\$24.95)

• Vol 3-Business (\$24.95)

• Vol 4-People (\$24.95)

• Vol 5-Animals (\$24.95)

* Vol 1-5-Special (\$99.95)

Money-back guarantee. (S/H \$3)

Send check or money order today.

Pixel Perfect

P.O. Box 2470

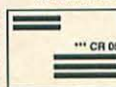
Escondido, CA 92033

619/480-1827

Data Base

SEND U.S. MAIL FOR ONLY 10.1¢ PER PIECE!

Z-CR finds "carrier route" numbers for your mail.



Pay only 10.1¢ when each address includes a carrier route number (some restrictions apply)

Z-CR program: \$199

Carrier route data for states: \$99 per floppy Z-CR CD-ROM (program + all U.S. data): \$945

Semaphore Corporation • 408-688-9200 207 Granada Drive • Aptos, CA 95003

Non-exclusive licensee of the U.S. Postal Service. The price of Z-CR is neither established, controlled, nor approved by the U.S. Postal Service. Payments are payable only to Semaphore.

CIRCLE 597 ON READER SERVICE CARD

FILEVISION® IV

DEMO AVAILABLE

Filevision was the very first Macintosh® visual information system that combined a drawing program with a database manager. Now it's

MORE POWERFUL THAN EVER!

Call or write for our FREE brochure:

TSP 4790 Irvine Blvd., #105-294 Software Irvine, California 92720

CIRCLE 600 ON READER SERVICE CARD

You Can Access More than 375,000 Macintosh Buyers

Put your product in front of the people who do more than just shop. Your ad in *The Macworld Catalog* links you instantly with more than 375,000 qualified buyers.

The Macworld Catalog is the direct response section for the Macintosh marketplace. It's action-oriented advertising that reaches the experienced users who know what they want, want it fast, and look for it here—each and every month.

The most readers. The least cost. Immediate access. Just call *The Macworld Catalog* at 800/888-8622 and place your ad—today!

800/888-8622

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Desktop Publishing

SwivelArt™

3D Clip Art for the Macintosh®



"SwivelArt is the best clip art I've seen in 3D."

-Jack Davis, Graphics Editor, Verbum Magazine

A lot of Macintosh users want to utilize graphics in their work - but don't want to create art from scratch or redraw every time they need a new perspective. SwivelArt's 3D images can be rotated, resized, viewed and used in any perspective. And a run-time version of award-winning **Swivel 3D™** makes it easy to use SwivelArt's high-quality 3D fonts, maps, and business graphics in black and white or **color**. For detailed information or to order **SwivelArt**, call:

(415) 956-4091, ext. 200 PARACOMP

Introductory price
\$99.95

CIRCLE 637 ON READER SERVICE CARD

Duplicator

For Expert 24 Hour
Software Duplication
Call 800-533-4188

- ◆ 100% Satisfaction Guaranteed
- ◆ Superb Six Step QC Process
- ◆ Turnkey Printing, Packaging & Assembly Service Provided

DATA SERVICES, INC.
In PA 215-363-2400

Educational

TEST GENERATION & SCORING!

LXR-TEST™ 4.0 is the most advanced testing system available. Full character styling (tabs, leading), exact graphic placement, database selection, scoring, mastery reporting, item analysis, and much more! Certified question banks available from major exam publishers.

For free presentation disk, call, write, or fax:
Logic eXtension Resources
9651-C Business Center Drive
Rancho Cucamonga, CA 91730
(714) 980-0046 Fax: (714) 987-8706

CIRCLE 614 ON READER SERVICE CARD

Macの日本語は クオリタスにお任せください!

Qualitas Trading is your Japanese Resource!

LaserWriter II NTX-J
inquiries welcome.

***EGWord:** Word processor. \$499
EGBook: DTP, Bundle Set: \$799

***Kanji PageMaker:**
DTP, International standard, Vertical
format, Color separation. \$995

***ByWord:** Word
processor, English supple-
mental manual. \$299

***MacVJE:** Front
end processor, Sophisti-
cated dictionary. \$249



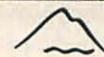
Qualitas Trading Co.

6907 Norfolk Rd., Berkeley, CA 94705
Phone: 415-848-8080 Fax: 415-848-8009

CIRCLE 571 ON READER SERVICE CARD

Free MakeTest Demo Disk

New, easy-to-use software stores questions and print tests easily in any format. Has features teachers most want at an affordable price. Only \$149, 30-day money-back guarantee. **To order MakeTest or demo disk, call 800-669-6574 or 415-665-5302.**



**MOUNTAIN LAKE
SOFTWARE, INC.**
258-B Laguna Honda Blvd.
San Francisco, CA 94116-1409

Physics/Chem Teachers:

The Physics Teacher's Test Maker.
The Chemistry Teacher's Test Maker.
Preprogrammed HyperCard Stacks
produce an infinite number of
exercises, each w/own answer sheet.
Each requires student effort plus time!
Pre-lab exercises, take home tests.
High School/College. 24 exercises in
each. All topics covered. Send for
complete information!
\$60 each/both \$100/demo disk \$10
Daedalus Scientific Software
P.O. Box 787
Oakland Gardens, NY 11364
718/423-3881

Teacher's Rollbook

A complete classroom management
tool! Grade averaging and reporting.
New quick grade entry • Full attendance
records and totals • Records disciplinary
actions • Class size reports • Up to 315
students per file • Remember birthdays
& checked out items • Letters to parents
• Min. req. Mac 512KE, 2 drives • \$99
• Demo \$10.
Current Class Productions
22824 Berendo Ave.
Torrance, CA 90502
213/326-4246

Continued...

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

Algebra I HomeworkTutor™
Turns your Mac into a private tutor that actually helps you do your Algebra homework. Checks each step, gives hints, create unlimited practice problems. Solves & explains examples while you watch. Full Mac interface plus "smart" math editor that's easier than pencil & paper. \$119.95 check/MO or call for free brochure.
Missing Link Software
P.O. Box 3280
South Amboy, NJ 08879
800/222-9296

The BEST SELLING Mac gradebook just got BETTER!

MicroGrade 2.0

New features by popular demand- MicroGrade is the easiest to use & most complete grade keeping program available!

Still only \$95!

If you're a teacher you owe it to yourself to send for our FREE literature.

CHARIOT • 3659 INDIA
#100, SAN DIEGO, CA 92103
(619)298-0202

CIRCLE 575 ON READER SERVICE CARD

Engineering

CIVIL, STRUCTURAL SURVEYING, DEED PLOTTING

LANDesign™
• COGO/Surveying
• Graphics always visible
• Import/export data
• Deed plot, map check
• Raster/stakeout
• Intersections
• Traverse adjustments
• US\$595 plus shipping
• US\$595 plus shipping

FRAME mac™
• Structural Analysis
• Frames, trusses, beams
• Enter data graphically or numerically
• Full graphics for structure, loads, axial, shear, moment, deflection
• Aggregate blending
• Unit conversions
• Plotting

One-month money-back guarantee. Free support.

Other programs available for:
• Deed plotting
• Road design
• Contour mapping
• Terrain modeling
• Earthwork calculations
• Estimating
• Detention pond design
• Digitizer input

For free catalog or info, call or write:
COMPUnEering (416) 738-4601
113 McCabe Crescent
Thornhill, Ontario L4J 2S6
CANADA

CIRCLE 581 ON READER SERVICE CARD

DesignWorks 2.5™

Fully integrated and fully functional schematic and simulation on the Macintosh, featuring:

- integrated device symbol editor creates new symbols in seconds!
- advanced schematic editing features such as rotation, attributes, bussing, multipages, rubberbanding, Cut/Paste
- fully interactive digital simulation with logic-analyzer style timing display
- netlist support for SPICE, EDIF, PCad, OrCad, Douglas, Cadnetis, Redac, etc.
- full 7400, 4000, LSI, analog libraries

MacABEL 1.0™

Data I/O's industry-standard PLD design package is now available on the Macintosh, with enhanced design and simulation features:

- support for devices from Altera, AMD, Atmel, Cypress, Fairchild, Gould, Harris, IDT, Intel, Lattice, National, Ricoh, SGS, Signetics, SSS, TI, VTI and others.
- interactive, "in-circuit" simulation support when used with DesignWorks.

DesignWorks: \$995 MacABEL: \$2350
Call for your free demo kit today!



Capilano Computing
545-108th NE, Suite 6
Bellevue, WA 98004
(604) 669-6343

CIRCLE 573 ON READER SERVICE CARD

THE BOTTOM LINE:

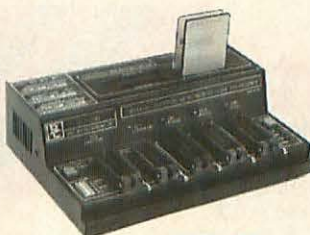
There's no easier, faster, or more economical way to get your message in front of today's Macintosh buyers than to advertise in *The Macworld Catalog*.

Call:

800/888-8622

to reserve your space today!

E(E)PROM, MICRO & MEMORY CARD PROGRAMMERS WITH INTEGRATED MAC USER INTERFACE



\$345 - 595

- Connects to modem port. Pull-down commands menus.
- No personality modules for E(E)PROMs & Intel Micros.
- All 24/28/32 pin EPROMs to 1 Mbit (upgradeable to 32 Mb).
- 8741, -2, -4, -8, -16, -32, -64, -128, -256, -512, -1024, -2048, -4096, -8192, -16384, -32768, -65536, -131072, -262144, -524288, -1048576, -2097152, -4194304, -8388608, -16777216, -33554432, -67108864, -134217728, -268435456, -536870912, -1073741824, -2147483648, -4294967296, -8589934592, -17179869184, -34359738368, -68719476736, -137438953472, -274877906944, -549755813888, -1099511627776, -2199023255552, -4398046511104, -8796093022208, -17592186044416, -35184372088832, -70368744177664, -140737488355328, -281474976710656, -562949953421312, -1125899906842624, -2251799813685248, -4503599627370496, -9007199254740992, -18014398509481984, -36028797018963968, -72057594037927936, -144115188075855872, -288230376151711744, -576460752303423488, -1152921504606846976, -2305843009213693952, -4611686018427387904, -9223372036854775808, -18446744073709551616, -36893488147419103232, -73786976294838206464, -147573952589676412928, -295147905179352825856, -590295810358705651712, -1180591620717411303424, -2361183241434822606848, -4722366482869645213696, -9444732965739290427392, -18889465931478580854784, -37778931862957161709568, -75557863725914323419136, -151115727451828646838272, -302231454903657293676544, -604462909807314587353088, -1208925819614629174706176, -2417851639229258349412352, -4835703278458516698824704, -9671406556917033397649408, -19342813113834066795298816, -38685626227668133590597632, -77371252455336267181195264, -154742504910672534362390528, -309485009821345068724781056, -618970019642690137449562112, -1237940039285380274899124224, -2475880078570760549798248448, -4951760157141521099596496896, -9903520314283042199192993792, -19807040628566084398385987584, -39614081257132168796771975168, -79228162514264337593543950336, -158456325028528675187087900672, -316912650057057350374175801344, -633825300114114700748351602688, -1267650600228229401496703205376, -2535301200456458802993406410752, -5070602400912917605986812821504, -10141204801825835211973625643008, -20282409603651670423947251286016, -40564819207303340847894502572032, -81129638414606681695789005144064, -162259276829213363391578010288128, -324518553658426726783156020576256, -649037107316853453566312041152512, -1298074214633706907132624082305024, -2596148429267413814265248164610048, -5192296858534827628530496329220096, -10384593717069655257060992658440192, -20769187434139310514121985316880384, -41538374868278621028243970633760768, -83076749736557242056487941267521536, -166153499473114484112975882535043072, -332306998946228968225951765070086144, -664613997892457936451903530140172288, -1329227995784915872903807060280344576, -2658455991569831745807614120560689152, -5316911983139663491615228241121378304, -10633823966279326983230456482242756608, -21267647932558653966460912964485513216, -42535295865117307932921825928971026432, -85070591730234615865843651857942052864, -170141183460469231731687303715884105728, -340282366920938463463374607431768211456, -680564733841876926926749214863536422912, -1361129467683753853853498429727072845824, -2722258935367507707706996859454145691648, -5444517870735015415413993718908291383296, -10889035741470030830827987437816582766592, -21778071482940061661655974875633165533184, -43556142965880123323311949751266331066368, -87112285931760246646623899502532662132736, -174224571863520493293247799005065244265472, -348449143727040986586495598010130488530944, -696898287454081973172991196020260977061888, -1393796574908163946345982392040521954123776, -2787593149816327892691964784081043908247552, -5575186299632655785383929568162087816495104, -11150372599265311570767859136324173632990208, -22300745198530623141535718272648347265980416, -44601490397061246283071436545296694531960832, -89202980794122492566142873090593389063921664, -178405961588244985132285746181186778127843328, -356811923176489970264571492362373556255686656, -713623846352979940529142984724747112511373312, -1427247692705959881058285969449494225022746624, -2854495385411919762116571938898988450045493248, -5708990770823839524233143877797976900090986496, -11417981541647679048466287755595953800181972992, -22835963083295358096932575511191907600363945984, -45671926166590716193865151022383815200727891968, -91343852333181432387730302044767630401455783936, -182687704666362864775460604089535260802911567872, -365375409332725729550921208179070521605823135744, -730750818665451459101842416358141043211646271488, -1461501637330902918203684832716282086423292542976, -2923003274661805836407369665432564172846585085952, -5846006549323611672814739330865128345693170171904, -11692013098647223345629478661730256691386340343808, -23384026197294446691258957323460513382772680687616, -46768052394588893382517914646921026765545361375232, -93536104789177786765035829293842053531090722750464, -187072209578355573530071658587684107062181445500928, -374144419156711147060143317175368214124362891001856, -748288838313422294120286634350736428248725782003712, -1496577676626844588240573268701472856497451564007424, -2993155353253689176481146537402945712994903128014848, -5986310706507378352962293074805891425989806256029696, -11972621413014756705924586149611782851979612512059392, -23945242826029513411849172299223565703959225024118784, -47890485652059026823698344598447131407918450048237568, -95780971304118053647396689196894262815836900096475136, -19156194260823610729479337839378852563167380019295232, -38312388521647221458958675678757705126334760038590464, -76624777043294442917917351357515410252669520077180928, -153249554086588885835834702715030820505339040154361856, -306499108173177771671669405430061641010678080308723712, -612998216346355543343338810860123282021356160617447424, -122599643269271108668667762172024656404271232123489488, -245199286538542217337335524344049312808542464246978976, -490398573077084434674671048688098625617084928493957952, -980797146154168869349342097376197251234169856987915904, -1961594292308337738698684194752394502468339713975831808, -3923188584616675477397368389504789004936679427951663616, -7846377169233350954794736779009578009873358855903327232, -15692754338466701909589473558019156019746717711806654464, -31385508676933403819178947116038312039493435423613308928, -62771017353866807638357894232076624078986870847226617856, -125542034707733615276715788464153248157973741694453235712, -251084069415467230553431576928306496315947483388906471424, -502168138830934461106863153856612992631894966777812942848, -1004336277661868922213726307713225953263789933555625885696, -2008672555323737844427452615426451906527579867111251771392, -4017345110647475688854905230852903813055159734222503542784, -8034690221294951377709810461705807626110319468445007085568, -16069380442589902755419620923411615252220638936890014171136, -32138760885179805510839241846823230504441277873780028342272, -64277521770359611021678483693646461008882555747560056684544, -128555043540719222043356967387292922017765111495120113369088, -257110087081438444086713934774585844035530222990240226738176, -514220174162876888173427869549171688071060445980480453476352, -1028440348325753776346855739098343376142120891960960906952704, -2056880696651507552693711478196686752284241783921921813905408, -4113761393303015105387422956393373504568483567843843627810816, -8227522786606030210774845912786747009136967135687687255621632, -16455045573212060421549691825573494018273934271375374511243264, -32910091146424120843099383651146988036547868542750749022486528, -65820182292848241686198767302293976073095737085501498044973056, -131640364585696483372397534604587952146191474171002996089946112, -263280729171392966744795069209175904292382948342005992179892224, -526561458342785933489590138418351808584765896684011984359784448, -1053122916685571866979180276836703617169531793368023968719568896, -2106245833371143733958360553673407234339063586736047937439137792, -4212491666742287467916721107346814468678127173472095874878275584, -8424983333484574935833442214693628937356254346944191749756551168, -16849966666969149871666884429387257874712508693888383499513102336, -33699933333938299743333768858774515749425017387776766999026204672, -67399866667876599486667537717549031498850034775553533998052409344, -134799733335753198973335075435098062997700069551107067996104818688, -269599466671506397946670150870196125995400139102214135992209637376, -539198933343012795893340301740392251990800278204428271984419274752, -1078397866686025591786680603480784503981600556408856543968838549504, -2156795733372051183573361206961569007963201112817713087937677099008, -4313591466744102367146722413923138015926402225635426175875354198016, -8627182933488204734293444827846276031852804451270852351750708396032, -17254365866976409468586889655692552063705608902541704703501416792064, -34508731733952818937173779311385104127411217805083409407002833584128, -69017463467905637874347558622770208254822435610166818814005667168256, -138034926935811275748695117245540416509644871220333637628011334336512, -276069853871622551497390234491080833019289742440667275256022668673024, -552139707743245102994780468982161666038579484881334550512045337346048, -1104279415486490205989560937964323332077158969762669101024090674692096, -2208558830972980411979121875928646664154317939525338202048181349384192, -4417117661945960823958243751857293328308635879050676404096362698768384, -8834235323891921647916487503714586656617271758101352808192725397536768, -17668470647783843295832975007429173313234543516202705616385450795073536, -35336941295567686591665950014858346626469087032405411232770901590147072, -70673882591135373183331900029716693252938174064810822465541803180294144, -141347765182270746366663800059433386505876348129621644931083606360588288, -282695530364541492733327600118866773011752696259243289862167212721176576, -565391060729082985466655200237733546023505392518486579724334425442353152, -1130782121458165970933310400475467092047010785036973159448668850884706304, -2261564242916331941866620800950934184094021570073946318897337701769412608, -4523128485832663883733241601901868368188043140147892637794675403538825216, -9046256971665327767466483203803736736376086280295785275589350807077650432, -18092513943330655534932966407607473472752172560591570551178701614155300864, -36185027886661311069865932815214946945504345121183141102357403228310601728, -72370055773322622139731865630429893

The Macworld Catalog



PUZZLEMAKER™
Many Puzzles Included
DESIGN IT
FLIP, ROTATE &
SCATTER THE PIECES
THEN SOLVE IT!
Create Your
Own Puzzles For Fun and Learning
SUMMER SPECIAL US \$49.95
PLUS \$4 SHIPPING. REG. PRICE US \$69
125, 3553-31 St. N.W., Calgary, AB, CAN T2L 2K7
Orders Call Collect
IMATEQ (403) 282-6720

CIRCLE 689 ON READER SERVICE CARD

PostScript® Font Software

SAVE UP TO 35% OFF LIST PRICE

Authorized Dealer For:

Adobe Image Club
Bear Rock Kingsley ATF
Bitstream Letraset
Casady & Greene Linotype
Compugraphic Monotype
Hewlett Packard The Font Company
Linguist (Foreign Languages)

1-800-248-FONT

PRECISION TYPE 1-800-248-3668 516-543-3636
47 MALL DRIVE, COMMACK, NEW YORK 11725
*PostScript is a registered trademark of Adobe Systems Inc.

CIRCLE 609 ON READER SERVICE CARD

Financial

Your planning strategy has just improved!

- Instant financial planning, budgeting, modeling and analysis
- More control, quicker decisions and numerous options
- Increase cash flow and your bottom line/Lotus 1-2-3 or Excel
- Seven business financial models and four budget/cash flow programs

Order Today!

Reg. \$595 Special \$399

1-800-777-4920

ILAR Systems Inc., 334 Baywood Drive
Newport Beach, CA 92660
714-759-8987

CIRCLE 620 ON READER SERVICE CARD

Fonts

FONTagenix™
4 volumes of dot-matrix display and text fonts
ARTagenix™ Collection of graphics
LASERgenix™ Cyrillic, ipa, others
6 Downloadable Laser fonts
\$39.50 ea.

FOREIGN FONTS EDITION™
22 foreign language fonts on one disc **\$69.50**

Customized Fonts & Logos Available
All Orders add \$3 s/h, CA res. add 6% tax
(714) 621-0973

Devonian International Software Company
P.O. Box 2351
Montclair, CA 91763

CIRCLE 578 ON READER SERVICE CARD

Genealogy

Family Roots™

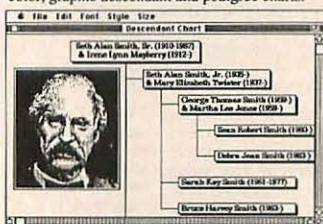
Do it YOUR way! Huge variety and capacity for your family history. Make pedigree charts, descendants charts, person sheets, group sheets, indices and much more. Customize to your own preferences. Standard Mac interface. Call for FREE information. Satisfaction guaranteed MC/Visa/AE.
Quincept
Box 216
Lexington MA 02173
617/641-2930, 800/637-ROOT

Family Heritage File™

Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy professionals
• Enhanced • Fully relational • Graphic Pedigree, Family Group, Individual, Marriage, Surname • Unlimited History
• Sorted Lists • Export to WP/data base/modem. \$149 + \$5 s/h. Demo \$7. Visa/MC. Free Lit Pak.
Star-Com Microsystems
Windsor Park East
25 West 1480 North
Orem, UT 84057
801/225-1480

REUNION™ the family tree software

Reunion quickly records and displays family information and images. Click to navigate through generations of ancestors. Create large, color, graphic descendant and pedigree charts.



Family groups • reports • histories • references • index • user-defined fields • mail merge • birthday calendars • GEDCOM • much more. Call, write, or FAX for a free brochure and sample printouts.

LEISTER PRODUCTIONS
14 Hill Blvd., Mechanicsburg, PA 17065
717-697-1378 — FAX 717-697-4373

CIRCLE 613 ON READER SERVICE CARD

Graphics

Full Color On Small Macs

You don't need a color printer or color software - what you need is color "brainware". Learn how to produce multicolored documents and clipart on your present Mac and printer. Transform your HyperCard® clipart to HyperColor Art. Easy to follow step-by-step instructions. Given in a Technical College Graphic Arts Instructor's "How to Manual". \$15 postpaid.
Logic Press
P.O. Box 330
Sebeke, MN 55477-0330

HyperCard Stacks

Wild Things™

The easy way to learn XCMDs. Wild Things provides all the tools you need to get started writing your own XCMDs in C Pascal or FORTRAN.
• Source code for 40 XCMDs
• Utility routines and templates
• Sample stacks
• Full-featured icon editor
• No license fees
Language Systems Corp.
441 Carlisle Drive
Herndon, VA 22070
703/478-0181

SmartCards™ FlashCards

Learn Spanish, French, Italian or German vocabulary or blank cards to use with any subject. Over 2000 words. Much more than a simple flash card program. All the usual functions plus sorting function which lets you decide which words you want to learn. Streamlines learning by concentrating on the words you miss - not the words you already know. If you've been disappointed by other flashcard programs you'll love SmartCards. \$25 each + S&H.
Sunshine Software
800/552-8341

Japanese Exercises

Accelerate your recognition of Japanese characters and words using our Hiragana/Katakana and Kanji Exercises. Flexible and instantaneous response to access phonetic pronunciation, animated character generation, noun-verb-adjective reading exercises, quizzes, search options. Kana word list 1600. Cost: \$45. Kanji compound word list 900 with 319 characters. Cost \$65. Requires HyperCard 1.2 or higher.
ANONAE SOFTWARE
P.O. Box 7629
Berkeley, CA 94707
415/527-8006

FREE!
TEXTURE
It's easy to receive 16 FREE TEXTURES from Prism. Just circle the number below on the MACWORLD Free Product Information Card and drop it in the mail. We will rush our special offer to you at no cost. Don't miss your chance, even the postage is FREE!

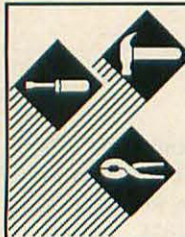
CIRCLE 633 ON READER SERVICE CARD

Continued...

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog



HYPERTOOLS® VERSION 2 ALL NEW TOOLS!

HyperTools® #1 & #2, the tools of choice by thousands of HyperCard® users, just got better! Add up the benefits yourself: Two toolkits + 16 unique tools per kit + tool selection palette + each tool appears in its own dialog + tools work on multiple objects at a time!

HyperTools® #1: cursor editor & animator; group tools (move objects/data to other cds/bgs/stacks); cross reference & info tools; alignment, font, size, object style, ordering, & array creation tools for multiple fields & buttons; hide & seek vis/invis items; create slidebars, radiobutton/checkgroup groups; performance, resource & preference Tools.

HyperTools® #2: airbrush, pattern mover, rulers, FKEYs, protractor, color window, special effects & object hiliter; measurement tool; data validation; field sorting, formatting & pop-up choice lists; order, sort & scan cards.

Still Just \$99.95 each. Existing HyperTools® owners, call today for special Upgrade pricing!

Special Features

- Install once, use from any card or stack!
- 16 Unique Tools in each product
- Use with old or new HyperCard. Special Features for HC 2.0!

TRENDWARE CORPORATION

PO Box 2285
Huntington, CT 06484
(203)926-1116

CIRCLE 667 ON READER SERVICE CARD

HYPERSNOOP™

For HyperCard™ programmers

This debugging and archiving tool extracts stack scripts and settings, as you designate, from any stack. Use stored results to study, modify, or make a text file archive of your stack. Complete Macintosh™ interface for easy use, with detailed manual.



- ⇒ Works on any stack
- ⇒ Analyzes scripts
- ⇒ Continual progress display
- ⇒ Use on all or part of your stack

Requires HyperCard™ 1.2 or higher, hard disk recommended.

S.P.E. Software
P.O. Box 1560
Fallbrook, CA 92028
Phone orders call
24 hours, 7 days
1-800-350-8219

\$28 Delivered
V/MC Welcome
Shipping and sales tax included

CIRCLE 612 ON READER SERVICE CARD

You can learn French, German, Russian, Spanish or Latin FAST with MacFlash Cards!

Over 2000 words & 1000 synonyms. Complete, accurate, multi-word English translations. Use it as a "point and click" dictionary. Test yourself on noun gender. Save word sets to disk. Ideal for ESL. German I/II, French I/II, Spanish I/II, Russian I, Latin I: \$25 each. S&H \$3, CA Res add 7.25% tax. Money-back guarantee. Call or send for additional information. Order today by calling 1-800-283-4080 X850

The Language Quest Software Company
101 First Street, Suite 428, Los Altos, CA 94022

Next Day Shipping
Free Add-Your-Words Stack

CIRCLE 683 ON READER SERVICE CARD

Languages

MACTRAN PLUS Ver. 4.0
Integrated Made-for-Mac Development System. Includes: Editor, Optimizing Compiler, Source level Debugger, Linker, Library Manager, Profiler and Build facility. Supports 68020/030 & 68881/2 native code. Significant Vax Fortran & ANSI 8x extensions. High & Low level tool box interface. Unlimited code segment size.
DCM Data Products,
610 One Tandy Center
Fort Worth, TX 76102
817/870-2202
Fax 817/336-2416

Fortran on Your Desktop
No need to wait for time on the "big" computer any longer. Language Systems Fortran lets you run the same high performance Fortran programs at your desk. VAX-compatible extensions, high precision IEEE floating point data types, complete access to Toolbox, direct code generation for the Mac II, and the MPW programming environment make this compiler the most powerful Fortran for the Mac.
Language Systems Corp.
441 Carlisle Drive
Herndon, VA 22070
703/478-0181

Lottery

Sixty Days After Ordering MacLotto® A California Man Wins \$195,821.00!

A Teacher Uses MacLotto® for the First Time.. And Wins 13 Prizes! - Totaling Over \$7,300.00!

Take the MacLotto Demo !!

MacLotto Version 2.1 Has Arrived! A Powerful, Intuitive User Interface Makes MacLotto the Perfect Wagering System for Strategies from \$3 to Much, Much More... Each of the 7 Wagering Tool Screens has Full ON-LINE Help plus Theory... This Demo will even Generate Combinations! Call with MasterCard or VISA on our Toll Free Number Now! The MacLotto Demo is \$10 (Refundable Towards Full Purchase!)



MacLotto® uses TWO Scientifically Proven Methods of Lotto & Keno Wagering which Dramatically Improves Your Chances of Winning MORE Prizes!...and Dramatically Improves your Chances of Winning Millions of Dollars MORE Each and Every Time You Play!

Can't Wait? - Order MacLotto Now!

U.S. Math Labs, 18 Main Street, Concord Ma. 01742
\$99 Complete! MasterCard and Visa call our TOLL FREE number! No COD sorry. Write us or you can FAX your order direct! 1-508-653-9193

1 - 800 - PLAY - SIX

CIRCLE 628 ON READER SERVICE CARD

Medical

MediSearch™

Communications/research software to access NLM's MEDLINE direct with a powerful, friendly Mac interface. Saves time and money. Easy to learn features for both new and sophisticated Medline users. Formats retrieved information for Word processor, EndNote™, and FileMaker™. Comprehensive manual. Satisfaction guaranteed. \$149 ppd in US. PO/MC/VISA.

Shoestring Solutions
402 Cortland Ave.
San Francisco, CA 94110
800/333-9462

Medical Office Mgmt.

TessSystem™ software for insurance and billing. Our \$1295 package outperforms software selling at three times that price. Expandable line to grow with your needs. Call for product literature and DEMO software today! New modules include electronic claims and multi-user for Mac networks.
Wabash Medical Resources, Inc.
6865 Parkdale Pl., Suite A
Indianapolis, IN 46254
317-299-7800

Multimedia

MacAnatomy™/MacSurgery™

...an electronic atlas of Anatomy in 4 volumes on disk in MacPaint™ format. Easily altered and copied to any program via the clipboard. Ideal for students of Anatomy in all the health and legal professions. ...is a HyperCard™ stack with multiple-choice questions and answers. Detailed discussions and documentations are provided. Ideal for continuing education and board preparation.
MacMedic Publications
7530 Harwin
Houston, Texas 77036
713/977-2655

explore
multimedia

Attention Macintosh Plus/SE Users

Discover the new tools of expression and advanced interactive media techniques that are now possible on your Macintosh Plus or SE.

The complete Exploring Multimedia package includes a book and three disks.
\$99.95 (U.S.) VISA/MC

Cheshire Grin Productions Ltd.
Suite 43, 2145 Sherbooke Road
Mississauga, Ontario Canada L5A 3G8
Phone (416) 238-2744 Fax (416) 238-5078
Requires Macintosh Plus or higher, hard disk, HyperCard 1.2

CIRCLE 658 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Music/MIDI

Best prices & Support on Music Software, Hardware & Systems for the Mac. Summer Special!

AUDIOMEDIA Mac BEAT!

visa
mc card
am/ex call 1-800-MAC-BEAT
1-505-988-1710

CIRCLE 656 ON READER SERVICE CARD

2.2
New with
short ear training

PRACTICA MUSICA™

Ear Training & Music Theory for Everyone

"Best New Education Program, 1987"
-MacUser Magazine

- Teaches intervals, chords, melody, rhythm
- Interactive staff notation • Saves scores
- High quality sound • MIDI compatible
- Historical & computer-generated melodies
- Custom ear training melodies
- Includes textbook • Beginners to advanced

\$125 • Call Toll Free 800-445-4866

ARS NOVA
BOX 637, KIRKLAND, WA 98083

CIRCLE 560 ON READER SERVICE CARD

Nutrition

Improve Your Nutrition

MacDINE® takes the guesswork out of nutrition for improved health.

Finds food with selected amounts of nutrients for meal planning, cholesterol lowering and weight reduction.

Analyzes your meals, snacks, recipes and physical activity.

5656 foods, expandable database with 24 nutrients, 194 activities.

Satisfaction Guaranteed!

DINE Systems, Inc.
688 North French Road
Amherst, New York 14228
1616/668-2492 FAX 688-2505

Programming Tools

NEW!!
68000, COP800, PIC16xx versions!

μASM™ Cross Assemblers for the Macintosh™

• TEXT EDITOR, CROSS MACRO ASSEMBLER, AND COMMUNICATIONS FACILITY IN A COMPLETE INTEGRATED DEVELOPMENT ENVIRONMENT
• S OR HEX FILE OUTPUT DOWNLOADS TO MOST EPROM PROGRAMMERS

\$149.95 ea
plus S/H*

AVAILABLE FOR MOST 8-BIT MICROPROCESSORS AND 68000/010. CALL OR WRITE FOR TECHNICAL BULLETIN.
30 DAY MONEY BACK GUARANTEE. MC/V/AE.

Micro Dialects, Inc
DEPT. MW, PO BOX 30014
CINCINNATI, OH 45230
(513) 271-9100

CIRCLE 624 ON READER SERVICE CARD

Public Domain

Programs for MAC!

PD & Shareware at incredible prices!

- Games
- Graphics
- Business
- Stacks
- Utilities
- Education
- DA's
- Fonts
- Utilities

Call Toll-Free for Catalog!
1-800-346-0139

GEMINI™ Headquarters:
P.O. Box 640
Duvall, WA 98019-0640

Marketing, Inc.

CIRCLE 653 ON READER SERVICE CARD

FREE - 6 DISKS - FREE FULL OF MAC SOFTWARE

TRY US! Get 6 disks full of our best selling software - **FREE!**
Games, Business, Education, Graphics, Programmers' Utilities, Finance, Desktop publishing, more.
PAY ONLY \$5.00 FOR SHIPPING

SATISFACTION GUARANTEED!

INTERNATIONAL SOFTWARE LIBRARY

511-104 Encinitas Blvd • Encinitas CA. 92024



619 942-9998
since 1985



CIRCLE 554 ON READER SERVICE CARD

SOFTSHOPPE, INC.

- ✓ Selected Programs
- ✓ As Low as \$2.50
- ✓ Virus-Free
- ✓ Same Day Shipping
- ✓ No Minimum Order

FREE CATALOG MAC PD/SHAREWARE

Call 800-829-BEST (2378)
Fax 313-761-7639

CIRCLE 651 ON READER SERVICE CARD

FREE!
MAC CATALOG

Software, Ribbons, Labels, Books, Etc.

Best Bits & Bytes
P.O. Box. 8225-MACW
Van Nuys, CA 91409

CALL NOW!
TOLL FREE-24 HRS.
1-800-245-BYTE

CIRCLE 572 ON READER SERVICE CARD

Real Estate

REALTY WORKS™ v. 2.0

- Complete Farming System (Mail Labels, Letters, CMA Form, Seller's Net Sheet, Databases)
- Quick MLS Access (with a modem)
- Real Estate Investment Analysis
- Loan Payments, IRR, NPV, PV, Nper
- TD/Mortgage Investment Yields
- Property Management System
- Professional Quality Reports
- and much more for \$399...

DEMOS AVAILABLE



Computer Solutions For Real Estate Professionals

818 • 989 • 2298

CIRCLE 655 ON READER SERVICE CARD

Continued...

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

Property Management III

RealData's latest — A comprehensive management and accounting package for residential and commercial property, *PM III* is ideal for the individual owner as well as the professional manager. It offers integrated AR, AP and GL, maintenance tracking, lease abstracting, and extensive management and financial reporting. Available in four levels, handling from 50 units to unlimited, priced from \$395 to \$1495. **Evaluation copy, with documentation, just \$45 (plus s/h)**

Don't forget our best seller, *Real Estate Investment Analysis* for sophisticated income-property evaluation. Analyze income, cash flows, financing, rates of return, tax consequences and more. **\$250**

Also for investors, our new *Real Estate Partnership Plus*. Structure your limited partnership projections and presentations. **\$295**

REALDATA®
78 North Main St., South Norwalk, CT 06854

ORDERS ONLY 1-800-899-6060
INFO (203) 838-2670
FAX (203) 852-9083

CIRCLE 638 ON READER SERVICE CARD

Sales/Marketing

Market Master for Mac
MacGuide calls it "the Best Sales lead follow-up you can buy." Enter leads whenever you get them & *MarketMaster™* contacts the right people the right way at the right time. Prints letters, envelopes, phone lists, scripts, & NEVER FORGETS! Easy to learn & use. Frees salespeople to SELL & supports them to SELL MORE!

Breakthrough Productions
10659 Caminito Cascara
San Diego, CA 92108
619/281-6174

ORDER & INVOICE MANAGEMENT SYSTEM

For...
Manufacturers
Reps
Wholesalers
Distributors

CONTROL IT™ Tracks customers, orders, invoices, requests and payments; Commission receivable and payable. **Predicts** cashflow. **Manages** back orders and product shipments. **Analyzes** promo response and product performance.

DiamanteSoftware

800-223-2165

11651 Plano Rd., Ste. 160 Dallas, TX 75243

CIRCLE 650 ON READER SERVICE CARD

Property Management
Comprehensive software for managing residential, commercial, condos, and more. Two versions: Basic PM for owner/manager — \$495, Deluxe PM with complete general ledger for professional management — \$1,195. Includes check writing, recurring expenses, financial statements, complete management reporting.
Yardi Systems, Inc.
813 Reddick St.
Santa Barbara, CA 93103
805/966-3666

Religion

Bible study tools that grow with you.



THE WORD processor
The most comprehensive Family of Products for Bible Study.

Start with **VERSE SEARCH** including the Bible translation of your choice with Instant Access to any verse. Search for any words or phrases. Separate windows for comparing verses. And much more! Only \$99.95

AS YOU GROW, add NIV, RSV, KJV or NKJV text, Greek or Hebrew transliterators or topical cross references, personal commentary, a chronological Bible and chain references. Our memory resident **VERSE TYPIST** transfers verses to your word processor.

Bible Research Systems
1-800-423-1228

2013 Wells Branch Parkway #304 • Austin, Texas 78728
Tech Support (512)251-7541 Postage extra. For IBM, MSDOS, Macintosh.

CIRCLE 568 ON READER SERVICE CARD

Real Estate Software

The Ten Minute

■ **Property Manager** \$495/\$995

Accounting system for multiple properties. Ideal for investors who manage their own properties.

■ **ProAnalysis** \$333 \$295

A Sophisticated investment analysis program designed for the investor who demands professional quality analysis.

Demos Now Available!

Metropolis
Software

499 Hamilton Ave.
Suite 202
Palo Alto, CA 94301
(415) 322-2001

CIRCLE 623 ON READER SERVICE CARD

Scientific

Geological Software

Great graphics, low prices! • Lithologic log plotting • Gridding • Contouring • Piper/Stiff plots • Oil & Gas economics • Stereonet plots • Plate tectonics • Geophysical modelling, +much more for the Macintosh & PC \$50-\$1500. Call or write for FREE catalog of easy-to-use software products.

RockWare Inc.

4251 Kipling Suite 595

Wheat Ridge, CO 80033

303/423-6171, Telex: 9102504964

Mail order
can save
you time—
and money!

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Spreadsheets

Spreadsheet Compiler

At last, you can convert your Microsoft Excel templates into royalty-free stand alone applications. This means big savings for your users and increased sales for you because your users no longer need a spreadsheet program to run your templates. Special features include: charts, buttons, icons, pictures and sound resources. For only \$495, we invite you to try Masquerade™ at no risk with our **30 Day Money Back Guarantee**. Visa & MC accepted.

To order or for more information call (714) 842-2492

Night Diamonds Software P.O. Box 1783 Huntington Beach, CA 92647

CIRCLE 699 ON READER SERVICE CARD

Statistics

CLR ANOVA

Analysis of variance program that can compute up to a 10-way design with repeated measures and unequal n. Marginal means, plots of interactions, simple effect, range tests, contrasts, and more. Full Mac interface. Can read text files w/entries separated by spaces, commas, or tabs. \$100 + \$3 s/h.

Clear Lake Research

2476 Bolsover #343

Houston, TX 77005

713/523-7842

Services

Computer Insurance

Insure in one easy step!

ComputerInsurance PLUS

ComputerInsurance PLUS replaces your computer after fire, theft, power surge, natural disasters, including earthquake. Call **Now** to receive comprehensive coverage and full replacement.

THE COMPUTER INSURANCE AGENCY, INC.

136 Moore Lane • P.O. Box 385

Piedmont, SC 29673

Local 803-845-6699 • Hours: 10 a.m. to 6 p.m.

1-800-722-0385

CIRCLE 677 ON READER SERVICE CARD



SOFTWARE

INSURES YOUR COMPUTERS

Full replacement of hardware, media, purchased software. As low as \$49 yearly. Covers fire, theft, power surges, other accidents. Blanket coverage; no list of equipment needed. Call for information or immediate coverage.

1-800-848-3469

Local (614) 262-0559

SAFWARE, The Insurance Agency Inc.
2929 N. High Street, P.O. Box 02211
Columbus, OH 43202

CIRCLE 640 ON READER SERVICE CARD

Data Conversion

WE CAN CONVERT DATAFILES TO/FROM OVER 1,500+ SYSTEMS IN VIRTUALLY ANY FORMAT! — ON DISKS OR TAPES!

Systems like:

- Mainframes
- Minis
- Microcomputers
- Dedicated Word Processors
- Typesetters, etc.

Formats like:

- MacWrite*
- Microsoft Word*/Works*
- WordPerfect*
- Excel*
- Omnis*
- 4th Dimension*
- FileMaker*
- Jazz*
- Tab-delimited ASCII, etc.

*Trademarks of their respective companies

CompuData Translators, Inc.

3325 Wilshire Blvd. Ste. 1202

Los Angeles, CA 90010

800/825-8251 • 213/387-4477

CIRCLE 579 ON READER SERVICE CARD

Computer Repair

MAC+/SE POWER SUPPLY
NOW ONLY **\$218**
INCLUDES INSTALLATION TESTING & 2ND DAY SHIPPING

800K/1.44 FLOPPY DRIVES
GENUINE SONY REPLACEMENT **\$188**
INSTALLED REG. LIST \$450.

2.5 MB MEMORY
INSTALLED ONLY **\$188**
WITH ABOVE REPAIRS

FAST 80 NS

FAST NEXT DAY SERVICE

We're MAC specialists dedicated to MAC Users. Call us today for • Repairs • Upgrades • Hard Drive Repairs

Mac Friends

CALL NOW TOLL FREE **800 622-8804**

CIRCLE 599 ON READER SERVICE CARD

TAPE/DISK CONVERSIONS

Conversion services to or from over 2000 computer systems:
• Magtapes • Mini Computers
• Micro Computers • Typesetters
• Word Processors

CALL THE INDUSTRY LEADERS

PIVAR

COMPUTING SERVICES, Inc.

800-CONVERT

708/459-6010

165 Arlington Heights Rd #MC

Buffalo Grove, IL 60089

MINITAB on the Mac

Flexibility and a powerful range of statistical functions — master basic as well as advanced capabilities — within one hour.

- Regression
- ANOVA
- ANCOVA
- Time Series
- Hi-Res Graphics
- Macro Capabilities
- and more

Now available for Mac II, Plus & SE

CALL 800-448-3555

MINITAB
STATISTICAL SOFTWARE

3081 Enterprise Drive / State College, PA 16801

CIRCLE 681 ON READER SERVICE CARD

Mac Repair

- Apple™ Certified Technicians
- One-Day Service Turnaround*
- Mac Plus Upgrades from 128/512
- Up to 75% below Dealer Rates
- Memory and Hard Disks
- Firm Price Quotes by Phone
- Hard Disk Repair & Recovery
- Nationwide Pickup & Delivery

*on most repairs. Visa/MC/AX. Fast overnight air express available. We use genuine Apple™ parts. Our #1 source of new business is referrals from satisfied customers! Mac Shop is a "Macintosh Way" company.

MAC SHOP • (800) MAC-PLUS

Mac Shop • 2200 NW Birdsall • Gresham, OR 97030 • (503) 667-0851 • (800) 622-7587

CIRCLE 682 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog

Desktop Publishing

HIGH QUALITY
SLIDES
FROM YOUR
MAC
OVERNIGHT SERVICE



PERSUASION
POWERPOINT
POSTSCRIPT
1-800-940-9414
5205 NW 33RD AVE.
FT. LAUDERDALE, FL 33309

CIRCLE 596 ON READER SERVICE CARD

SLIDES! **DIGITAL PHOTO**

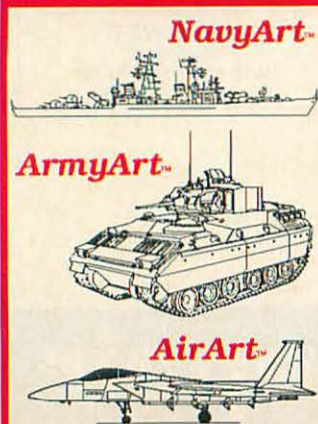
- * WILL IMAGE ANY PICT, PICT2, 32 BIT PICT, 24 BIT TIFF
- * QUALITY SERVICE & TECH. SUPPORT

POSTSCRIPT SLIDES, TOO!

FOR MORE INFORMATION:
402-393-1744 **\$5**

CIRCLE 585 ON READER SERVICE CARD

MILITARY CLIP ART



Each \$89.95 plus \$4 s/h Visa • MC
800-441-1228 314-365-4146

Storm King Technology

One Imperial Ct • Lake Ozark, MO 65049

Hundreds of images of US and foreign military equipment and US insignia. Professional quality for illustrations, publications and presentations.
Best variety. Best quality. Best value.

CIRCLE 577 ON READER SERVICE CARD

Waldman graphics

Printers + Typographers

Desktop Designer's Super Service Bureau

Maintain highest quality standards and lower your costs. We can accept any PostScript file for B/W and full color output. Original electronic art and PostScript effects our specialty. Complete Visionary Gateway and V.I.P. services to powerful Scitex color center. Knowledgeable people, high resolution output, color proofing, quick turnaround.

- 1270 & 2540 dpi pages from Linotronic L300s ■ Repro, Pos. & Neg. film ■ Disk Conversion ■ 24 hour Modem ■ QMS ColorScript 100
- Scitex Color Imaging & Separations
- Full Electronic Prepress ■ High Quality Color Printing ■ Mailing
- 20 Messengers to NYC, Phila., N.J.
- Discount Adobe Dealer

Call Mike Gladden or
George Gunzelman for more
information about our
extensive DTP services.

609/662-9111 800/543-0955
Modem - 609/662-3788

CIRCLE 669 ON READER SERVICE CARD

We image: PICT, PICT 2,
32-bit PICT, Scrapbook,
TIFF, PostScript



\$5 Slides

The "original" Mac
\$5 imaging service!

We're not just another PC imaging house, we're expert
Macintosh slide makers!

- True customer service
- Unsurpassable 4K quality
- Color overheads and hard copy available

24 Hour Turnaround Standard (Rush Available)

In NY State Call: **212.989.2727** Outside NY State Call: **800.445.9002**

Nextwave Productions NYC, NY

Via MasterCard, American Express, Corporate Accounts

CIRCLE 557 ON READER SERVICE CARD

MAKE \$50,000/YR IN DESKTOP PUBLISHING

Our DTP business is making
a killing. What's our secret?

Find out how to make more money
than you ever thought possible doing
something you enjoy. Guarantee your
success in this lucrative and fast
growing field. Call, write, or fax us
now for FREE information:

DTP Profit\$, Inc.

1600 Kapiolani Blvd., Suite 1328C
Honolulu, Hawaii 96814

Call (800) 367-5134 NOW!

(Ask for extension 3175)

Fax (808) 973-4358

CIRCLE 652 ON READER SERVICE CARD



Japanese PostScript

output • type • design • print

印刷紙やフィルムへの 2400 dpi (ドット・
パー・インチ) の高解像度出力サービス。

Modem or Disk **2400 dpi**

Call **314-241-0101**

Concord International, Inc.

CIRCLE 632 ON READER SERVICE CARD

IMAGESetting

- 1200 & 2400 dpi PostScript™
- Color PS Printing & Overheads
- Color, B&W, OCR Scanning
- Full Electronic Pre-Press
- Color Separations & Proofs
- DTP & Graphic Art Specialists
- Offset Color Printing Services

24-HOUR BBS/FAX LOW PRICES

ImageSet
Service Bureaus Printing Centers

Ann Arbor, MI 313/668-7330 Troy, Michigan 313/589-7784

CIRCLE 660 ON READER SERVICE CARD

Disk Duplication

DUPLICATION FROM \$.99 HIGHEST QUALITY MEDIA

Macintosh 3.5" DS/DD duplication
starts at just \$.99. Prices go even
lower as you continue to order!

- Duplication + 100% Verification
- Custom Labels/Sleeves/Mailers
- Custom Packaging & Assembly
- Colored Media Available
- Special Rates For Demo Software & Site Licensing
- Educational Discounts Available
- 24 Hour Turn-Around
- Guaranteed Products

800-255-3142

Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

CIRCLE 569 ON READER SERVICE CARD

Macworld Magazine.

When you get
down to
business, you
can't do
without it.

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Laser Recharge

TONER LASERQuip™ brand cartridge for HP, etc. 24 hour turnaround 100% Satisfaction Toner for NEC, Ricoh, Panasonic, Qume, etc. Colors...\$1.50 PC...\$1.50

2 DAY AIR Return Delivery

HP II-P cartridges rebuilt: 46.50
New cartridges from 79.50

800-777-8444

7615 Washington Ave. S. Edina, Minnesota 55435

•Franchises •Wholesale

CIRCLE 611 ON READER SERVICE CARD

reconditioned **TONER** cartridges! for laser printers & Canon PC Copiers

BETTER THAN NEW!
• 20% MORE TONER
• DARKER PRINT
• 100% GUARANTEED

From **\$44.95**

We buy empties call for brochure

Willow Products Corp. 3857 Willow Ave, Pgh, PA 15234

800-426-8196

WILLOW

CIRCLE 673 ON READER SERVICE CARD

Training

BS & MS in COMP SCI
The American Institute for Computer Sciences offers an in-depth correspondence program to earn your BS & MS degrees in Computer Science at home. BS subjects include: MS/DOS, BASIC, PASCAL, C, Data File Process, Data Structures & Operating systems. MS program includes Software Engineering and AI.

AMERICAN INSTITUTE for COMPUTER SCIENCES
1704-MW 11th Avenue
South Birmingham, AL 35205
TOLL FREE 1-800-767-AICS

Accessories Furniture

Furniture for the Macintosh

Nationally advertised fine oak furniture

Save up to 40%
factory direct!

• CAD-CAM WORKSTATIONS
• LASERWRITER CARTS
• PRINTER STANDS
AND MORE...

Call Now
For Free Catalog

1-800-333-8095
The Walker Company Petaluma, CA

CIRCLE 661 ON READER SERVICE CARD

"I saw it in Macworld!"

Mouse Pads

Company Logo Specialist

Qty.	Canvas	Hard Surface
12	\$8.50 w/logo	N/A
72	5.90 w/logo	7.15 w/logo
144	3.96 w/logo	5.21 w/logo
500	3.40 w/logo	4.65 w/logo
1000	3.28 w/logo	4.53 w/logo

Canvas or Hard Surface in a variety of colors. Size 9.5"x8"x3/8". Multi-color OK. SAMPLES with your logo \$12.50. ENTIRE pad imprintable and 100% guaranteed.

Computer Expressions
3833 Chestnut Street
Philadelphia, PA 19104
800/443-8278, 215/222-4400

Call us for your **MOUSE PAD** needs! We have the largest selection of styles and colors in the country. Large volume discounts. Disk Wallets and Books available. Mouse grips now in stock.

CLOTH PAD: 15 colors, 3 sizes
eg. SIZE: 8X9 1/2
12-3.50, 72-3.25, 144-3.00, 500-2.75

FAST PAD: 8 colors, 3 sizes
12-6.50, 36-6.00, 72-5.75, 144-5.00

PICTURE PAD: 17 stock and custom
12-7.95, 36-7.60, 72-7.35, 144-7.10

LEATHER PAD:
12-8.95, 36-8.60, 72-8.35, 144-8.10

PRECISION LINE INC.
14505 21st Ave N., Suite 206
Mpls, MN 55447
612-475-3550, fax 612-475-3577
1-800-328-0077

CIRCLE 626 ON READER SERVICE CARD

Supplies

Dust Covers
for a Clean Machine

Protect your equipment from dust, spills, and aggravating downtime with ABCOM DUST COVERS for personal computers.

Attractive, water-resistant packcloth in NAVY, SILVER, or BROWN

Custom-fitted, stylish, and durable.
With the original rainbow ribbon accent.
Extensive selection of dust covers for over 400 models, including:

- IBM
- APPLE II SERIES
- MACINTOSH
- and numerous printers.

MC & VISA ACCEPTED. PLEASE WRITE OR CALL FOR COMPLETE PRICE LIST AND BROCHURE
2333A N. SIERRA HWY, BISHOP, CA 93514
619/872-1946

CIRCLE 552 ON READER SERVICE CARD

1.44MB HIGH DENSITY 100% ERROR FREE PREMIUM BULK
1.44 MB 85c EACH 10 LOTS OF 25

800 KB DOUBLE DENSITY 100% ERROR FREE PREMIUM BULK
800 KB 39c EACH 10 LOTS OF 25

LIFETIME WARRANTY!

SONY DS/DD 800K (1MB) Box of 10
Minimum 2 Boxes \$ 8.49

SONY BULK -- 3.5" DS/DD lots of 50...49c
3.5" DS/DD 1.44MB lots of 25...\$1.49

ZOOM 2400BD MODEM w/QuickLink II...\$119.00
Seven (7) Year Warranty!... Mac 6" Cable -- \$ 9.95

AMERICAN GROUP
800-288-8025
12132 Sherman Way, N. Hollywood CA 91605
CALL OR MAIL

CIRCLE 676 ON READER SERVICE CARD

Reclaims Desk from Disks

The VDS 240
Vertical Disk Storage
• Holds 240 Disks
• Magnetic on Roll
• Front Disk Eject

"It's the only way to store disks"
-Jeff Walker, owner, MacOrkard

To Order: 1-800-942-4008
Vertical Solutions • P.O. Box 7535 • Olympia, WA 98507 • 206/352-2087

CIRCLE 694 ON READER SERVICE CARD

MacSac

For people going somewhere

Cordura exterior for durability. Thick, high-density foam padding for shock absorption. Padded pockets to protect keyboard, peripherals and drive. Color choices.

Backpack model and other styles available for the entire Macintosh line.

ComputerAid
800-343-3388
401-274-0595
P.O. Box 293, Barrington, RI 02806

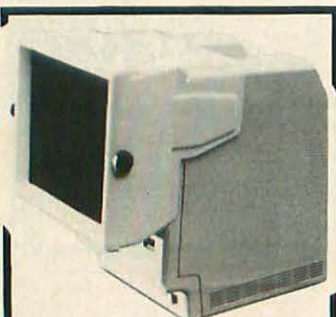
CIRCLE 641 ON READER SERVICE CARD

Continued...

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



The Macworld Catalog



NUVU GIVES EYESIGHT TO THE MAC BLIND

ENLARGE YOUR MONITOR SCREEN OVER 70%!

High quality lens by 3M coupled with a Polaroid anti glare filter. In a sleek mounting hood designed specifically for Mac monitors.

FINALLY A BIG CLEAR PICTURE!

To order, or for more info:

•800-872-1051•

Other models available.
Dealer inquiries invited.

Less Gauss Inc.
Box 5006 Rhinebeck, N.Y. 12572

CIRCLE 601 ON READER SERVICE CARD



A 50-YEAR TRADITION
ZERO HALLIBURTON

The Best Case Scenario

Airline Check-in or Local Use
Zero Halliburton Aluminum Mac Cases:
Lightweight, Durable, Distinctive Styling
Plus/SE IIcx II/IIx Monitor Cases
Portable Attache ImageWriter II

from \$299.95 1-800-542-4591
TCC 13101 Wash. Blvd., #110, L.A., CA 90066

CIRCLE 607 ON READER SERVICE CARD

CUSTOM ENCLOSURES FOR DISK, TAPE & OPTICAL DRIVES

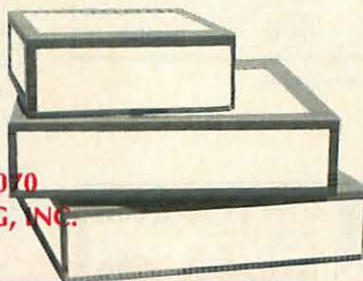
Specially designed & produced to meet your requirements!

- Plastic •Metal
- High Tech
- High Quality

Call Today for information, price quotes to meet your needs... (619) 695-1070

LIEN ENGINEERING, INC.

7940 Arjons Dr.
San Diego, CA 92126



CIRCLE 598 ON READER SERVICE CARD

Never buy another ribbon!

Over 150,000 sold!!



\$45.00

MacInker™, the Automatic Ribbon Re-inker, re-inks any printer ribbon (black & color) for 5 c. Lubricating ink cools printhead, extends its life and yields better-than-new printout. Average re-inkings per cartridge: 60-100. **Universal MacInker** (spec. printer) \$75. **Imagewriter I/II** \$45. Adapters available for multicolor cartridge, \$40. Complete range of black, color, heat transfer, special ink cartridges. Satisfaction or 30 day refund. Free key-beeper-flashlight for orders >\$100.00. **Order toll free** or call to get full information.

Computer Friends
14250 Science Pk. Dr.
Portland OR 97229
tel. (503)626-2291
fax (503)643-5379

CIRCLE 700 ON READER SERVICE CARD

3.5" DS/DD Bulk Disks
39¢ ea. in lots of 25

3.5" DS/HD Bulk Disks
89¢ ea. in lots of 25

3.5" Disk Cases - Protects up to 50 Disks
\$2.97 each (for 2 or more)

Apple ImageWriter I & II Ribbon
\$1.67 each (In Packs of 6)

4-Color Apple ImageWriter II Ribbon
\$5.97 each (In Packs of 2)

Mouse Pad **\$2.99** each

3.5" User Labels - In Assorted Colors
(\$1.50 per pack of 50 labels)

Add shipping - 55¢ per 25 3.5" disks; 80¢ per disk case; \$1.00 per pack of ribbons; 55¢ per mouse pad; User Labels - No shipping charge
Add Order Processing, Packaging & Handling - **\$3.00 Per Order**

MEI/Micro Center - 1100 Steelwood Rd.
Columbus, Ohio 43212



Call 1-800-634-3478

MWC8

DUST COVERS
100% COTTON CANVAS

ComputerWear
MAC, SE, II, & PRINTERS
Beige w/ Grey Trim Breathable! Static-Free!
NEW! Seal-Skins
For Keyboards

1-(800) 826-5761
Int'l: (415) 759-1466 Fax: (415) 564-0506
Contemporary ComputerWear 1320-36th San Francisco 94122

CIRCLE 586 ON READER SERVICE CARD

Runaway Disks in MacBag...

Are your disks always falling out of your MacBag lid? Keep them in their place! For simple instructions on reducing this problem send \$3.00 and a self-addressed, stamped envelope. To receive information on other misc. neat ideas (non-Mac) send \$2.00 and a SASE to:

F. Abernathy
P.O. Box 23048
Columbus, OH 43223

Pack your Mac in seconds!

Cordura case has internal padded pockets for mouse, keyboard and drive.

Available in six colors. Extended Keyboard version also available.

For a dealer near you call toll free

1-800-548-0053
West Ridge Designs
1236 N.W. Flanders
Portland, OR 97203

CIRCLE 670 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

The Macworld Catalog



Available in MacRed, MacIvory, or MacGrey



MacBIT BUCKET™

\$3.95 Keeps your work area clean, tools handy. Flat back adheres easily to any device.

J-BAR ASSOC.

Box 9101 Southboro, MA 01772
(508) 485-0878

Disk Drive / Tape Power Supplies



Low Cost / Affordable Power Supplies for Disk, Tape and Optical Drives. Compact, proven reliability with agency approval.

Introductory Offer - ONLY
\$24.95*

Please Call

Lien Engineering, Inc.

(619) 695-1070

7940 Arjons Dr.
San Diego, CA 92126

*OEM
Quantity
Price

CIRCLE 622 ON READER SERVICE CARD

Business Opportunities

LaserCharge & TRW INTRODUCE LaserMaintenance

TWO WORLD LEADERS NOW OFFER THE NUMBER ONE SERVICE TRAINING OPPORTUNITY.

The rapid market penetration of laser printers and copiers in the U.S. and around the world has created an increasing need for qualified service personnel in this dynamic industry. LaserCharge and TRW are meeting this need with the exclusive offering of the new LaserMaintenance Training Program.

Through LaserCharge's exclusive agreement with internationally recognized TRW, LaserMaintenance enrollees receive three days of expert service and maintenance training, complete tool kits, training manuals and video tape, access to printer and copier replacement parts, and all the technical backup required to create your own laser printer and copier service business. All travel and lodging

expenses are covered in a special turn-key package.

The new LaserMaintenance program is being offered in combination with LaserCharge's highly successful toner cartridge recharge training program. Act now and **save up to \$2000 off the total combination price** (limited time offer).

Call today for full details on this exciting new opportunity from LaserCharge. Because of their highly detailed curriculum, both LaserCharge and LaserMaintenance training classes are limited in size, so make your reservation soon. Now is the time to take advantage of this excellent income producing career program.

In Canada, call LaserNet.
416-847-7823.

**SAVE UP TO
2000.00
DOLLARS**

**LaserCharge
TRW
1-800-999-8134**

CIRCLE 668 ON READER SERVICE CARD

Deskette™

Available in 1 to 16 drawer models capacity: 72 to 152 3.5" diskettes. Available in Clear, Smoke, Black, & Fluorescent Green. Soft rubber feet make Deskettes stackable and easy on the desktop. Built-in dividers and self-adhesive label-holders on each drawer. Made of 100% Acrylic for strength and durability.

R&R Computer Solutions
1501 E. Chapman Ave., Suite 168
Fullerton, California 92631
800-323-6545 / 714-996-6545

CIRCLE 664 ON READER SERVICE CARD

FREE CATALOG COMPUTER SECURITY PRODUCTS

• Theft Protection • Unauthorized Access/Use Control • Software Security

1-800-766-LOCK

DOSS INDUSTRIES
1224 Mariposa St. SF CA 94107

CIRCLE 618 ON READER SERVICE CARD

Miscellaneous Mailing Lists

MAILING LIST of Mac Users

On labels, tapes, disks, CD-ROM, or by modem



Choose from hundreds of thousands of users at residences, businesses, or schools, in any ZIP code range. 2¢ to 5¢ per name. Free selecting, sorting, delivery. Call for free custom counts. Semaphore Corporation, 207 Granada Dr., Aptos, CA 95003 (408) 686-9200 (voice) 662-2717 (modem)

CIRCLE 642 ON READER SERVICE CARD

FREE FORMATTING

On Your 1st Order

	200 QTY.
SONY or MAXELL	.59 3.5"
VERBATIM	.57 DS/DD
DATASAFE	.49

SONY or TDK	1.69 3.5"
DATASAFE	1.29 DS/HD

3M or VERBATIM	.49 5.25"
BASF	.45 DS/DD
DATASAFE	.39

BASF or VERBATIM	.69 5.25"
DATASAFE	.59 DS/HD

5.25" disks include sleeves.

(800) 426-0247

PRINCETON
DISKETTE

432 MacArthur Dr. Brick, NJ 08724

CIRCLE 563 ON READER SERVICE CARD

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.

BEST-SELLERS

Months on chart

Last month

This month

▼	▼	▼		
64	1	1	Microsoft Word	Microsoft
43	4	2	Microsoft Works	Microsoft
55	2	3	Microsoft Excel	Microsoft
51	3	4	Aldus PageMaker	Aldus
16	5	5	FileMaker II	Claris
17	9	6	QuarkXPress	Quark
40	6	7	MacWrite II	Claris
49	—	8	MacDraw	Claris
8	10	9	Wingz	Informix
10	—	10	Aldus FreeHand	Aldus

BUSINESS SOFTWARE

EDUCATION SOFTWARE

18	2	1	Where in the World Is Carmen Sandiego?	Broderbund
31	1	2	Reader Rabbit	The Learning Company
5	5	3	Where in the USA Is Carmen Sandiego?	Broderbund
9	4	4	Math Rabbit	The Learning Company
46	—	5	Math Blaster	Davidson & Associates

ENTERTAINMENT SOFTWARE

7	2	1	Tetris	Spectrum HoloByte
9	1	2	SimCity	Maxis Software
43	—	3	MacGolf	XOR/PCAI
44	3	4	Microsoft Flight Simulator	Microsoft
1	—	5	Welltris	Spectrum HoloByte

NETWORK/DATA COMMUNICATIONS

43	1	1	TOPS	Sitka Corporation
38	2	2	AppleShare	Apple Computer
44	—	3	LocalTalk	Apple Computer
11	—	4	Netware for the Macintosh	Novell
4	4	5	MicroPhone II	Software Ventures

Months on chart

Last month

This month

▼	▼	▼		
22	—	1	MacStack SD20	CMS Enhancements
7	1	2	MacStack SD40	CMS Enhancements
2	4	3	Platinum PI 40 External	CMS Enhancements
1	—	4	Micro/Stack 20 External	MicroNet Technology
1	—	5	Micro/Stack 46 External	MicroNet Technology

HARD DISKS*

ADD-IN BOARDS/MEMORY

1	—	1	Apple 8-bit Color Card	Apple Computer
4	5	2	Spectrum/8 Series III	SuperMac Technology
33	1	3	Radius Accelerator	Radius
26	—	4	Apple 1MB Expansion Kit	Apple Computer
1	—	5	Apple 2MB Expansion Kit	Apple Computer

UTILITY SOFTWARE

5	1	1	SAM II	Symantec
5	3	2	SUM II	Symantec
3	4	3	Virex	HJC Software
5	2	4	Adobe Type Manager	Adobe
1	—	5	Pyro	Fifth Generation Systems

PRODUCT WATCH

Recent or forthcoming products of particular interest.

Muse *Occam Research*

Database that uses natural-language queries

RadiusTV *Radius*

Full-motion color TV display system

Sky Shadow *Casady & Greene*

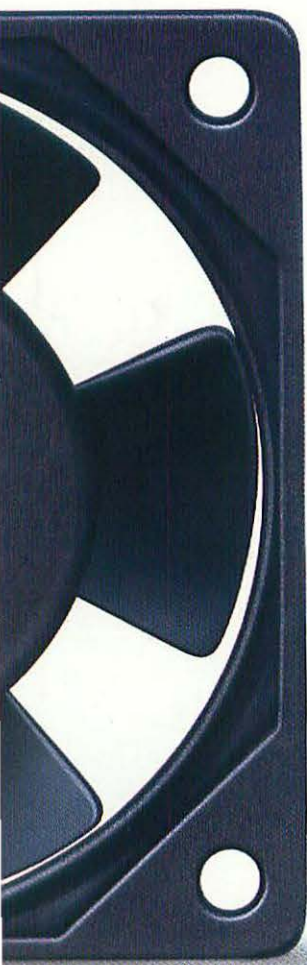
Defender-like arcade game

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during May 1990.

*Does not include hard disks installed at the factory.

Affordability
Has Always
Been The Best
Reason For
Buying Ehman
Hard Drives.

Now.

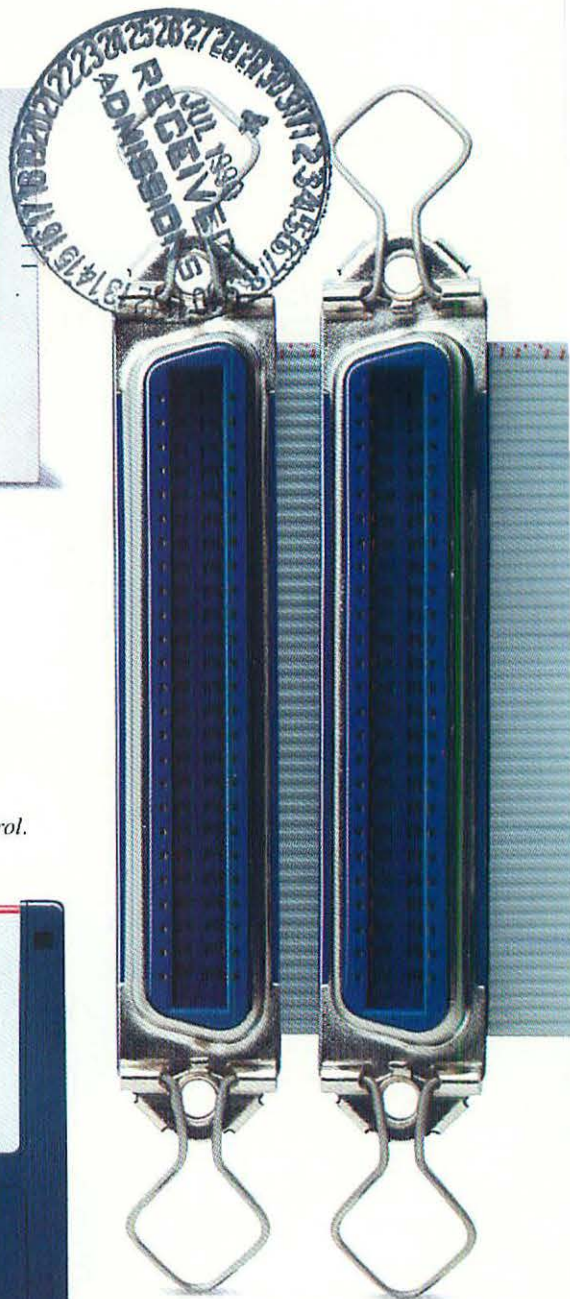


24-hour burn-in testing and improved quality control.

New
formatting
software
for clarity,
ease of
installation
and optimum
performance.



An improved manual
reduces learning time.



50-pin connectors to link peripherals.

e New E-Series.

manual makes learning to use your drive a snap. And all of the new E-Series drives will be tested twice, including a final 24-hour, system burn-in check. And if something does go wrong, Ehman is still backing all of its products with a 30-day, no questions asked money-back guarantee.

Now, if you think all these new extras will cost you extra, think again. The price is the only feature we haven't changed. Our external drives still start below \$300 and our popular SyQuest removable is just \$649 including a cartridge.

Whatever your reason for buying our hard drives, price or quality, call your Ehman sales representative and order yours today.

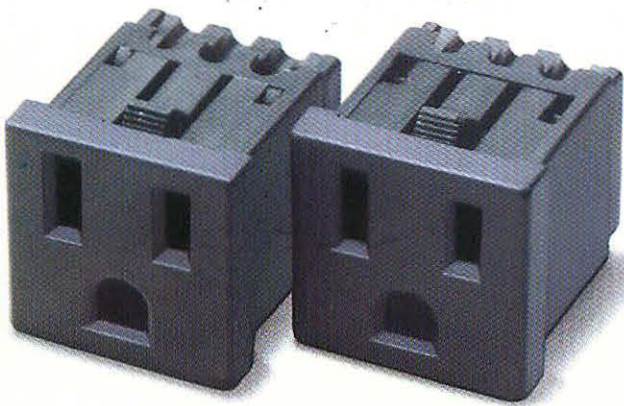
Hard Drives (MB)	Internal	External
20	\$249	\$299
30+	\$299	\$349
40Q	\$379	\$459
45	\$329	\$399
60+	\$399	\$449
80+	\$449	\$499
80Q	\$599	\$649
105Q	\$649	\$699
135	\$749	\$799
180	\$849	\$899
45 Removable		\$649

Ehman
The Apple Alternative

Seagate

Call 1-800-257-1666
or 1-307-789-3830
Fax 1-307-789-4656
Tech Support 1-307-789-1901

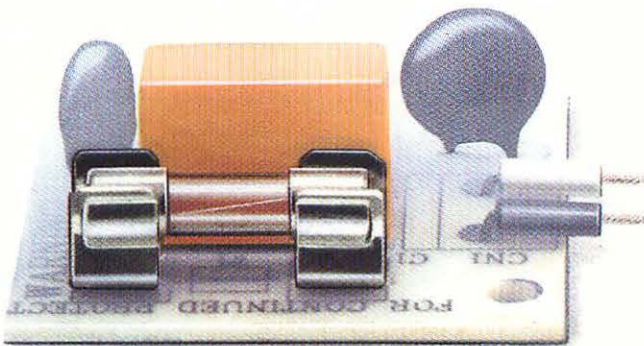
Circle 154 on reader service card



Two power outlets enable users to turn on an entire system from the drive.



A fuse access latch for quick and easy repair of a faulty fuse.



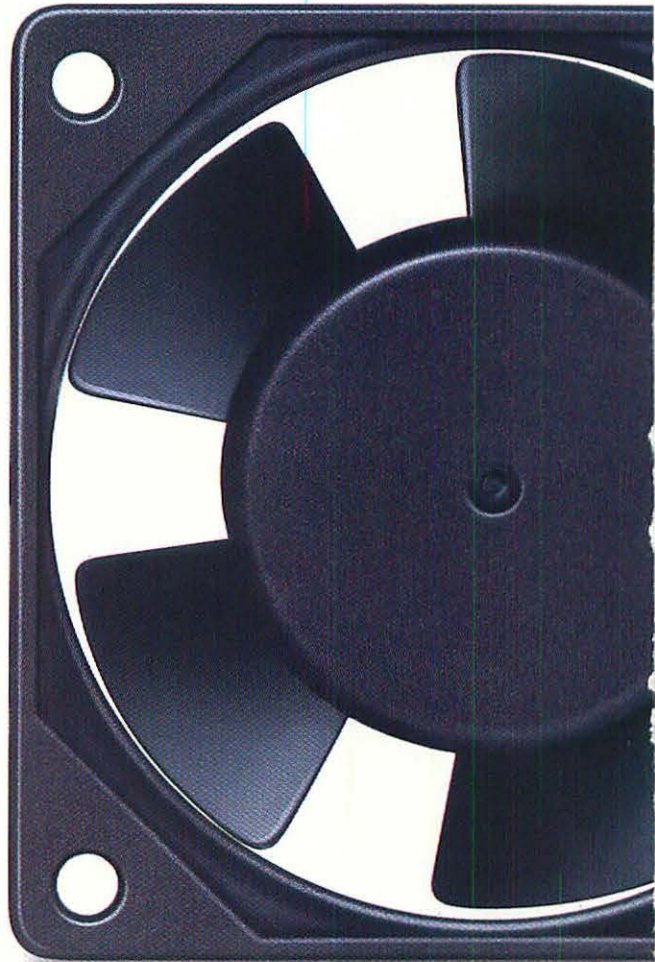
Dual-fuse circuitry for protection against power surges.

Since 1985, several hundred thousand Macintosh users have been interested in Ehman drives because of their attractive pricing. "Good product, great price and 30 days to change my mind," pretty much summed it up.

Until now.

Introducing the new Ehman E-Series of hard drives and removables. An enhanced line of products, loaded with features that bring you unsurpassed quality and reliability. The new enhancements include two power outlets that enable you to turn on your entire Mac system from your hard drive, and 50-pin cables that make daisy chaining a cinch. There's also a new, quieter fan that makes your Ehman drive *invisible* to the ear.

Until



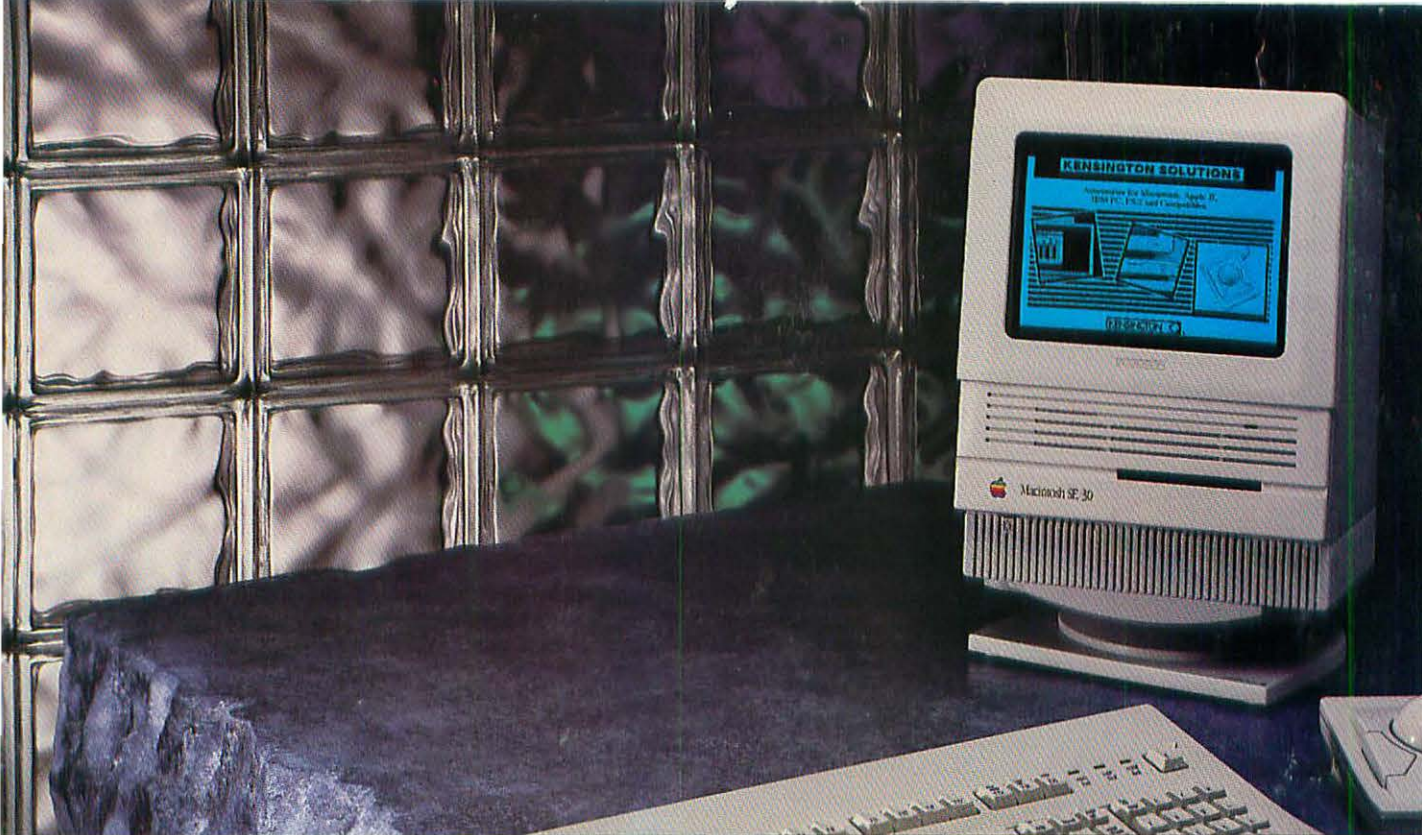
A new, whisper-quiet fan for an improved work environment.

Introducing Th

Our new formatting software is simple, yet sophisticated. It's essentially the same software used by companies that charge twice as much for their hard drives. You'll notice this difference right away.

But other extras may not be so obvious. Our dual-fuse circuitry, for instance, provides a second buffer in the event of an electrical surge, while our new smart voltage switch means Ehman drives automatically operate on both international and domestic currents.

The new E-Series also offers enhanced ease of use and reliability. A completely redesigned user



EYESORE VS. EYE PROTECTION

As today's monitors get bigger and brighter, anti-glare filters become less of an option and more of a necessity.

The right filter can combat eye fatigue, help eliminate headaches, even reduce overall body stress.

Yet, the irony is that something so good for your eyes can be such an eyesore.

In fact, most filters look like they belong to someone else's system.

The fit is sloppy. The colors don't match. The materials are different.

Kensington has a different idea.

Instead of making a filter that will fit on any monitor, we make filters

that will only fit a *specific* monitor.

An example is our Maccessories® SE Anti-Glare Filter.

It looks so much a part of the SE, you would think it was designed by the same people who designed the SE.

The styling is complementary. The color identical. Even the same material is used.

And unlike generic filters, the fit is perfect. So light passes through the filter, never around it.

Kensington uses only optical quality glass with a ceramic anti-reflection and scratch-resistant coating.

The result is a 96% reduction in glare. And an improvement in contrast and clarity of up to 20 times.

In short, the most advanced eye-protection system you can find today—it even filters out VLF and ELF radiation and dissipates static.

Kensington has custom designed screens for the Mac, Mac Plus, Mac SE, Apple IIGS, as well as for the entire Mac II family of large screen monitors.

For a free brochure, and the dealer nearest you, call 800-535-4242. In New York call 212-475-5200.



See us at Macworld Booth 5312

KENSINGTON.